AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

MARCH 1917 VOL. 23 — CONTENTS — No. 279

AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879

REAL ESTATE

FORESTS ∴ ESTATES ∴ PRESERVES
TIMBER LANDS ∴ FARMS ∴ CAMPS ∴ ETC.

SOUTH CAROLINA TIMBER

RED OAK

Timber on a South Carolina plantation or **entire plantation,** on the Great Pee Dee River in Marlboro County. Now occupied and under cultivation. Dwelling house occupied by owner. Several new small houses rented to colored help, barn, small saw mill. 1,140 acres cleared. 3,200 acres timbered; 1,250 acres fine large old growth timber, 700 acres large second growth timber over 50 years old; balance mostly thrifty, large second growth timber. Growth of Gum Pine, etc., very rapid. Many very large White and Red Oaks, Yellow Pine, Cypress, Sycamore, Cottonwood, Holly, etc., as shown in accompanying photograph.

A careful estimate shows the following:

BOARD FEET	VARIETY
6,770,000	Sweet Gum
3,520,000	Yellow Pine
1,680,000	Red Oak
1,560,000	White Oak
1,000,000	White Ash
790,000	Hickory
680,000	Sycamore
670,000	Maple
560,000	Elm
460,000	Cottonwood
390,000	Black Gum
390,000	Cypress
100,000	Holly
60,000	Birch
30,000	Willow
250,000	Other species
18,910,000	Total

DESCRIPTION OF THIS AND MANY OTHER TIMBER PROPERTIES FOR SALE MAY BE OBTAINED ON APPLICATION TO

DONALD E. LAUDERBURN
154 FIFTH AVENUE **NEW YORK CITY**

PENNSYLVANIA HEMLOCK

Like Father used to peel. The finest body of hemlock in Pennsylvania that may still be bought by operating companies. 700 acres. 10 million feet. Ideal logging conditions. Two trunk line railroads distant 12 miles over a good road down hill. In Susquehanna county.

PAUL P. LYON BRADFORD, PA.

GREAT HARDWOOD TIMBER TRACT

Thirty thousand acres with over three hundred million feet of timber in Eastern Tennessee. Cheap. Also pine tracts in North and and South Carolina. For information, address

W. D. HARRELL ROSE HILL, N. C.

100,000 OAK TREES

14″ to 40″. 71,000 Poplar, White Pine, Hemlock, Chestnut and Yellow Pine 14″ to 48″ for sale at $3.50 per tree, tan bark reserved. Principals only please answer.

A. R. THOMPSON
330 Williamson Bldg. CLEVELAND, OHIO

One of Westchester County's Most Productive Suburban Farms

300 ACRES IN HIGH STATE OF CULTIVATION

On State Road, one and one half hours by motor from New York City, few miles from well-known Hudson River town, in a very desirable section where quality of soil caused two leading Agricultural Schools to locate.

UNEQUALLED FOR COUNTRY ESTATE

as there are two splendid sites for residence, both with superb views. Extensive farm buildings of most modern type, all completely equipped. Farmer's cottages, dairy plant, cattle range, etc. A small fortune has been spent on this property in order to bring it up to its present fine state.

BARGAIN PRICE OF $300 PER ACRE

now asked by the owner is less than half its value. Full details from

KENNETH IVES & CO., Real Estate Brokers

7 East 42nd Street **Tel. Murray Hill, 6037** **New York City**

WOOD WORKING SHOP AND SAW MILL AND PLANING MILL

at Vergennes, Vt., located on a drivable stream. Good shipping facilities by rail or water. Purchase of plant carries with it contract for sawing logs which will run for two years.

DONALD E. LAUDERBURN
154 Fifth Avenue **New York City**

VIRGIN YELLOW PINE TIMBER LAND FOR SALE

36,000 acres Arkansas shortleaf yellow pine timber and land, near Iron Mountain Railroad. Will sell all or part. Liberal terms to operators. For particulars address the owners.

THE GRAHAM LUMBER CO.,
614 Wright Bldg., St. Louis, Mo.

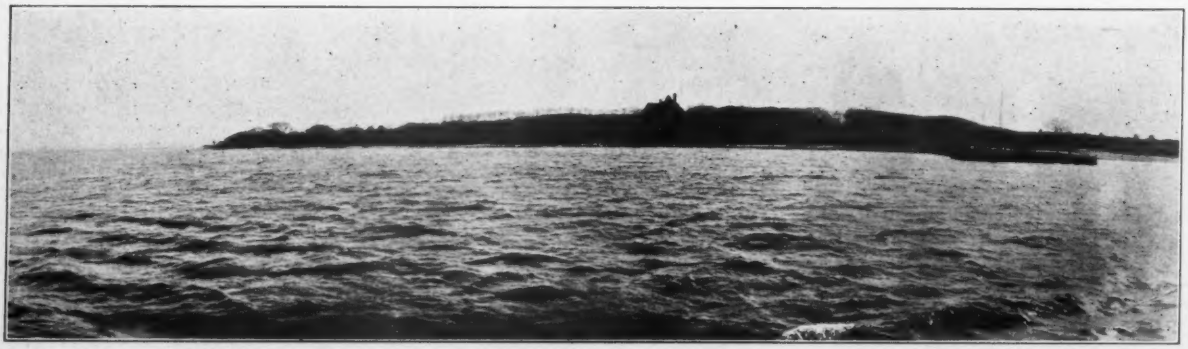
LONG ISLAND, NORTH SHORE

A high-class country estate in Smithtown Section. 250 acres of land—orchards, fields, meadow, woodland, modern house, fine view, etc. Large fine trees to water's edge. Will sell whole or part. Inquire of

J. R. E., care FIELD
2 West 45th Street NEW YORK CITY

LONG ISLAND REAL ESTATE ∴ **WARD & WARD** ∴ ESTATES, SHORE FRONTS FARMS AND PRESERVES

22 Exchange Place, NEW YORK CITY



ROBINS ISLAND IS A 500-ACRE PRESERVE NOW OWNED BY A CLUB. THIS IS ONLY ONE OF MANY PROPERTIES THAT ARE AVAILABLE NOW. OUR FACILITIES COVER EVERY KIND OF PROPERTY FOR SALE OR RENT IN EVERY PART OF LONG ISLAND.

FORESTS .·. ESTATES .·. PRESERVES
TIMBER LANDS .·. FARMS .·. CAMPS .·. ETC.

REAL ESTATE

VERMONT TIMBERLAND

3,330 acres containing 7½ million feet Hardwoods, over 2 million feet Spruce, 250 thousand feet Hemlock, also saw mill, 8 miles from railroad, as much more additional timber available.

DONALD E. LAUDERBURN
154 Fifth Avenue — NEW YORK

CAMPS ST. REGIS LAKES, THE SARANACS, LAKE PLACID, RAQUETTE, LOON, and LONG LAKES

Consult

DURYEE & CO.
ADIRONDACK REAL ESTATE BROKERS
SARANAC LAKE, NEW YORK

MURRAY BAY, CANADA

Cottages and Camps for sale or for rent this season. For information on all properties write to

M. G. TOWNSEND
Tel. 2977 Mur. Hill, 297 Lexington Ave., NEW YORK

PENNSYLVANIA TIMBER TRACT

FOR SALE—3500 acres in Bedford and Huntingdon Counties, in fee reserving mineral rights, average haul to railroad 2 miles or less, all down hill, 20 million feet Oak, Chestnut, Pine, Locust, Poplar, Maple, 15 miles from market for mine props and ties.

DONALD E. LAUDERBURN
154 Fifth Ave., — NEW YORK

ROCKAWAY VALLEY FARMS

Is in Northern New Jersey, only 30 miles or 65 minutes from upper or downtown New York. There is a wholesome community up in the mountains with every living convenience. Here a few acres may be bought at a reasonable price for an accessible, healthful home in the real country, with every natural advantage and every facility for country sport. One house with 5 master rooms may be rented for August and September. All particulars from

B. F. LITTELL
Boonton, R. F. D. No. 1 — NEW JERSEY

WHITE MOUNTAINS, N. H.
Elevation 1000 Feet

For Sale or Lease—An ideal summer home at the base of Mount Washington, midway between Poland Springs and Bretton Woods. 2000 feet frontage on State road enclosed by stone wall. House has 14 rooms, modern improvements, house and keepers' lodge furnished complete; garage and stable combined, 40x110 ft.; cattle barn, 38 x 110 ft.; laundry; work-shop has large open fire-place; lodge; plant-house; ice-house and wood-house filled for season's use; abundance mountain spring water, absolutely pure, supplied to buildings by gravity. Fine rich lawn with fountain in centre. A 1200-acre game preserve will be included if desired.

William H. Mills
7 East 42nd Street, New York

I OWN several well-timbered farms in the White Mountain region of New Hampshire commanding very beautiful views of lake and mountain and ideally situated for summer homes or fish and game preserves. I bought these primarily because of their scenic and timber values and to save them from ruthless denudation by portable saw mill operators. Most of them have trout brooks and some lake area within their boundaries. I will sell, to parties who wish to follow practical forestry methods in handling the timber growth, at prices representing but little more than the actual value of the standing timber. Most of them are located where large additional areas of growing timber can be secured at low cost. Also a forest tract of about 7,000 acres carrying 50 million feet of Birch, Maple, Beech, Ash and Poplar and 12 to 15 million feet of Spruce. Five small lakes and about three miles of shore on a large lake. Near railroad but secluded. No finer property in the East for fish and game club or forest preserve.

For particulars address

E. BERTRAM PIKE
PIKE, NEW HAMPSHIRE

"He Found a Million Feet"

in the tract he bought from you which he didn't know he was getting and you didn't know you had. This million feet was neither a gift nor a purchase. It did not figure in the price. It was a find—for him. But you?

You Lost a Million Feet

or maybe vice versa. Perhaps you sold him a million feet which you thought you had but which he didn't get, in which case

He Lost a Million Feet

No matter which way the cat may jump, the truth is that in a sound commercial transaction running into six or seven figures there ought not to be any "cat."

If the 37 years' experience of James D. Lacey & Company had been consulted the transaction might have been based on a LACEY REPORT, internationally recognized as the standard of timber values. Satisfaction and certainty would have resulted.

May we send you our Booklet, "Pointers"?

James D. Lacey & Co.

INTERNATIONAL TIMBERLAND FACTORS

EST. IN 1880

CHICAGO	SEATTLE	NEW ORLEANS
1750 McCormick Bldg.	626 Henry Bldg.	1213 Whitney-Central Bldg.

AMERICAN FORESTRY

VOL. XXIII MARCH 1917 NO. 279

RECREATIONAL USES OF THE NATIONAL FORESTS

BY HENRY S. GRAVES,
CHIEF FORESTER, U. S. DEPARTMENT OF AGRICULTURE

ONE of the important public interests in forest regions is their service for recreation and health. There is a rapidly increasing appreciation of the exceptional recreation resources which we have in this country and which our own people are just beginning to seek out and enjoy. There is also a growing appreciation that, like forestry, these resources will not be safeguarded and rightly developed in the public interests unless the public itself participates in their handling. In the past the wild lands of our upland and mountain regions have been more or less open for camping and hunting. Vast areas have been cut and burned off and their special attractiveness destroyed. As the timber stands become restricted greater care is exercised by the owners in their general use. Many owners fear to have campers on the lands because of the increased danger from fire. Some wish to hold the property exclusively for their own use. Others lease their lands to hunting and fishing clubs. The closing of private tracts is therefore constantly contracting the areas available for public use. How common it is for parties to find spots, where formerly they stopped to cpam over night, posted with "Private Land—Keep off." More and more large private preserves are posted with "No Trespass" signs, or the camper is met by a warden who requests him to move on. Local resentment in mountain countries at the closing of one large tract after another to the camping and hunting by the public is not wholly lawless. It is hard to see a few privileged persons control the mountains where formerly free access for recreation was allowed. There is the feeling on the part of the men who have guided, fished and hunted over these areas that they ought to belong to the whole people in common. And they are right, and if I am not mistaken a large part of these mountain lands will ultimately be publicly owned or controlled. The closing of private lands points to the value of publicly owned forest lands, where people living in urban communities and hot agricultural regions can find an opportunity for the refreshment and recreation that can be secured by a sojourn in the forest. More and more, therefore, the lands owned by the nation, the states, and local communities will have an importance as public playgrounds.

These facts apply with special significance to the National Forests. Located as they are chiefly in the mountain regions, the National Forests comprise many regions of superb scenery and unexcelled recreation attractions. It is not only to the noted mountain sections that I refer, as in the Olympic Mountains, the Cascades, Sierras, the Rocky Mountains, or here in the east in the White Mountains and Southern Appalachians. I have in mind also the lakes, both the larger ones like Chel an Tahoe, Pend Oreille, Cœur d'Alene, and the innumerable smaller lakes, the streams abounding in fish, the deep forests, the canyons, superb mesas, and other features that in infinite variety and interest occur throughout these forest regions.

ONE OF MANY WONDERS

There are hundreds and hundreds of scenic features in the National Forests. This, the Wheeler National Monument in the Rio Grande National Forest, Colorado, is one of them.

The problem of the recreational use and enjoyment of the public forests is not as some think one of mere sentiment. Of course there is sentiment in the enjoyment of fine scenery, in camping, in sport. Indeed, I feel sorry for the man who has no sentiment about the moun-

tains and their forest scenery. Neither is it a question of protecting the forests and scenic wonders for a few wealthy persons who can afford to take long trips on the railroad, buy expensive pack outfits, and so on. We have a very practical problem of opening up and making available the public properties for as wide a use as possible by people of little means as well as by those better-to-do.

The possibilities of public benefits of the recreational use of the National Forests and Parks was never better illustrated than during the past summer in Colorado. It was a time of great heat in the agricultural regions of the Plains States. Nearly seven hundred thousand people visited the National Forests of Colorado alone. Trains were crowded and hotels filled to overflowing. But thousands came in their automobiles or other conveyances, from the cities and farms, equipped with tents and cooking outfits, and camped in the Forests a day or two here and there, or often for a longer sojourn near a stream, a lake, mountain meadow, or other attractive spot.

The immediate service of the public forests for recreation is just as conspicuous in other portions of the National Forests. It is a regular thing for the people living in the valleys of California and southern Oregon and elsewhere to take during the hot summer frequent camping trips in the mountains, sometimes for a few days, sometimes for several weeks. Throughout the National Forests are found thousands of such campers, a large majority of whom are local residents from the valleys below, seeking refreshment from the heat. Some of the Forests already are visited by no less than fifteen to twenty thousand people each year; and I estimate that there are at least one and a half million persons who use the Forests in a single year, chiefly for recreation purposes.

In a very real sense the recreation attractions of the National Forests constitute a natural resource that must be safeguarded, utilized, and developed. It is a resource of great economic importance to the local communities. By its development every citizen in the locality benefits directly or indirectly. It is not only through the added business in furnishing accommodations, supplies, transportation, and so on, to the tourists, but many persons become regular visitors, often building summer homes and becoming permanently identified with the region. In a multitude of ways the local industries are stimulated.

A SUMMER CAMP IN A CALIFORNIA NATIONAL FOREST

It is a regular thing for the people living in the valleys of California and southern Oregon to take, during the hot summer, frequent camping trips in the National Forests. Some of the Forests are visited by no less than fifteen or twenty thousand people each year.

The recreation features of the National Forests are fostered in a variety of ways. First, by protection from defacement of those sections of special value and interest from a scenic and recreation standpoint. Systematically such areas, both large and small, are being searched out and designated so that the cutting of timber and other uses may not result in their injury. Such areas include mountain peaks, lakes, canyons of special interest, high mesas, roadways, and so on. In effect these constitute a multitude of parks and parkways within the Forests, to be used especially for recreation purposes.

ON A PACK TRIP IN THE FOREST

These tourists were among the 700,000 who visited the National Forests of Colorado during the summer of 1916. Trains and hotels were overcrowded and thousands traveled in their automobiles, or in wagons or, like these campers in the Uncompahgre National Forest, with pack horses.

BEAUTIFUL VIEW FROM SECTION OF NEW ROAD IN THE ROUTT NATIONAL FOREST

A view from the Rabbit Ears Pass road in the Routt National Forest, built by the Forest Service as part of the road system by which the National Forests are being opened up to pleasure seekers. It is estimated that about one and a half million people used the National Forests last year for recreation purposes.

But protection is only the beginning. The areas must be opened up and made available for use by the public. A few examples will illustrate some of our problems and how we are working them out.

In southern California, lying directly west of the Imperial Valley, rise the Laguna Mountains in the Cleveland National Forest. Those of you who have visited the Imperial Valley know something of the intolerable heat in the summer, situated as it is below the sea level. At times the temperature is said to remain above 110 degrees for eight or ten days and nights at a time. Thousands of people leave the valley in summer. In fact, it is estimated that the aggregate cost of these summer flights amounts for those communities to from one to three million dollars. We are now building a road from the main El Centro-San Diego highway into the mountains, to a very beautiful tract of forest situated at 6000 feet elevation. This road will enable people of the Valley to reach the forest tract in a few hours by automobile. The tract will be developed, in coöperation with the citizens, as a resort, with hotels, summer cottages, tents, and public camping grounds. Many hundreds can be accommodated who now have to travel long distances by rail to secure relief from the heat. It is a real problem of public health. It is also a matter of saving many thousands of dollars to the Valley people. Can any one say that from every standpoint that forest tract is not more valuable for recreation use than to cut into lumber?

A similar situation exists in the Coronado National Forest near Tucson, Arizona. Here the Santa Catalina Mountains rise some 5300 feet above Tucson on the desert, and are clothed with a splendid stand of timber, furnishing a cool and refreshing summer climate. Here the Forest Service has worked out a complete plan of public resort development, including a system of roads and trails, a water supply, sanitary provisions, a telephone system, playgrounds, and park areas for motors. The value of this resort, when completed, to the city of Tucson with its 20,000 or more inhabitants will be appreciated when one considers that during the summer months there is a difference of over 20 degrees in temperature of the mountains as compared to that in the city immediately below. Well-to-do people regularly flock to the California coast at this time; a means for recreation will, by the proposed plan, be afforded to all, and it is expected that 5000 or more would avail themselves of the advantage at the first opportunity.

Still another illustration is the development of the Angeles Forest that comprises the mountain ranges back of Los Angeles. Each year many thousand people visit this Forest for short trips or a night's camping. In addition there are being developed scores of summer communities and permanent camps. The canyons are lined with cottages and camps, and the highland forest areas are attracting people by scores for temporary and permanent summer accommodations. Every new road and

trail built by the Forest Service opens up new recreation sites, which are eagerly sought. It is in this Forest that the city government of Los Angeles, through its Playground Commission, has developed a municipal playground. After a diligent but vain search in the mountains and at the beaches for a suitable place nearer the city, the Commission asked for the setting apart of a suitable tract called the Seeley Flats. The purpose of the Commission was for the use of the public as a camping and recreation ground for the children of the city, and for other patrons of the municipal playgrounds. The following results were attained during the first year.

Four hundred and twenty-seven children were accommodated on the camping grounds, each one for a period of two weeks. The Commission estimates that next year this number will be from 1200 to 1500.

The charge for each person taken was $7.50, which included a trip from Los Angeles by electric car for 61 miles, followed by an auto stage ride of 15 miles to the camp, board for two weeks at the camp, and the use of a tent and cot during the stay, with return to Los Angeles by the same route.

After the opening of the schools, the tract was open to the parents of the children on similar terms.

About $800 was donated to the Commission by various people with which to defray the expenses of such children as did not have the necessary $7.50.

THIS SHOULD BE FREE TO ALL

The sign on the left-hand wall of the canyon marks a cave on patented land in the Pike National Forest. The public pays twenty-five cents to see it. If it were on Government land the public would pay nothing.

During the past summer the Commission expended, exclusive of salaries, $4552 on this playground, providing, among other things, a large outdoor plunge, a building, and a water system. Telephone connection was also maintained with the city. The plans approved for the coming season are quite elaborate; 25 cabins will be constructed during the spring months, a cement plunge will be built, a substantial building with kitchen, storeroom, and bedrooms will be constructed, and tennis and croquet courts will be laid out.

The Playground Commissioners have provided three instructors to teach the children all kinds of outdoor games and sports. Two or three evenings each week some prominent man from Los Angeles gives the children a "campfire talk." Each morning every boy camper donates an hour's service for cleaning up the camp and improving the grounds: in fact, everything indicates that most careful arrangements had been made for giving the city children an opportunity for recreation and the enjoyment of nature in the mountains.

A persistent effort had been made by one person to secure control of the tract under the allegation that it was chiefly valuable for farming. It would have been very profitable for him, as a real estate venture, to sell lots, for there is an active demand for such sites for summer camps. But the Secretary of Agriculture chose to put it to a public use, with the results I have described.

The action of the Playground Commission of Los Angeles has resulted in the starting of other camps of a similar nature. The Pacific Electric Railway, with 5000 employees, has applied for a tract about two miles distant where it proposes to build tent houses, dining-rooms and a store, and will rent these facilities to its employees at cost. The Masonic Lodge is looking for a site for its orphans.

Many cities are spending thousands of dollars for welfare work among children, but are hard put to find adequate playgrounds. The problem has been met in large measure by the Playground Commission of the city of Fresno, California. This Commission has recently been granted the use of a site of land near Huntington Lake in the Sierra National Forest, and proposes to transport annually 5000 children of the city to this National Forest during the heated months. The children will not only enjoy a unique outing, but, according to the plans of the Commission, will be given instruction in outdoor subjects.

In many cases the development of recreation areas becomes a coöperative enterprise by various public agencies. A conspicuous example is the Columbia Gorge division of the Oregon National Forest. This is located on the Columbia River and borders at many points the Columbia River Highway, which is one of the most famous drives in the world and one of the most attractive scenic features of the West. Certain areas have been permanently set aside in the Forest for protection and development in connection with the Columbia River Highway. The Forest Service has constructed a number of scenic trails like

that up to Larch Mountain and up Eagle Creek, and is developing public camping grounds at strategic points. In planning and carrying out this work we have the cooperation of county officials and the citizens of Portland, who are in some cases giving financial aid to various of the projects. The plans are correlated with those of the city and county in the entire Park and parkway enterprise.

A similar plan is being worked out in Denver in connection with development of the Mount Evans region, and with other communities which have direct interests in and adjacent to the Forests.

In the eastern mountains, too, we are fostering the recreational use of the National Forests. For many years the public regarded with increasing interest the efforts of Mr. George W. Vanderbilt to inaugurate a system of forest protection and conservation on Pisgah Forest in North Carolina, and not only that but to protect the natural game resources and to systematically increase them. Mr. Vanderbilt went beyond this. He constructed many miles of highway through the mountains and more than a hundred miles of first-class trails. After 20 years of this sort of care and development, Pisgah Forest passed to the Government and now is the Pisgah National Forest. Already it has been created a national game preserve in addition to being a National Forest, and definite plans are being carried out to maintain the great beauty of the mountain landscape, to develop the land to highest timber productiveness, and to further increase the fish and game resources. Under a plan of coöperation between the Biological Survey, the city of Asheville, and Buncombe County in which it is situated, the American Bison Society, and others, a plan is being worked out by which the elk and buffalo will be re-established on this Forest in large enclosures. It will be the purpose of the Government as far as its resources will permit to maintain and improve the roads and trails and in every way to increase the attractiveness of the Forest.

A NATIONAL FOREST LODGE
A type of small summer resort that is becoming popular in the National Forests. It is meant especially for transient guests.

In the White Mountains the public has an interest developed through many years of constantly increasing use. The point has been reached where hundreds of thousands frequent these mountains both in summer and in winter and find in them unsurpassed conditions for enjoyment and recreation. The state of New Hampshire has coöperated in providing five automobile highways leading through the mountains and various outing organizations have as a result of many years' enthusiastic work constructed hundreds of miles of trails which are freely opened to the tramping public. Specific plans are being worked out by which the Forest Service will encourage still further the development of facilities for the recreational service of this wonderful region to the public.

From Biological Survey.

A PARADISE FOR SPORTSMEN
Good fishing can be had in most National Forest streams and lakes. Here at Lake Margarete on the Routt National Forest is found some of the best. Year by year the number of men who flock to such places on the National Forests is increasing by thousands.

The use of the Forests for recreation has been fostered by the fact that term leases may be secured for periods up to 30 years for the construction of hotels, for summer cottages, and similar purposes. Many are already taking advantage of this opportunity to establish a summer home in the Forests; of special importance is it to secure a systematic development of hotels, rest houses, and other accommodations to visitors. Sites are being

leased and developed for this purpose in a plan-wise fashion, public camp grounds are being improved by the Forest Service, maps and circulars are furnished to visitors, and all are given a cordial and coöperative welcome to use the public facilities.

A rapid development for recreation is following the building of roads and trails that has for its purpose the general opening up of different parts of the Forests. Already there have been built about 25,000 miles of trails and some 3000 miles of roads. Most of the trail work has been done for fire protection or general communication. But many of the trails pass through sections of surpassing scenic interest.

BOY SCOUTS IN THE NATIONAL FOREST

In such regions the boys find everything needed to amuse and interest those who love the outdoors, and in camps and traveling they acquire much-needed instruction regarding nature.

At the last session of Congress there was appropriated a special fund of ten million dollars to be available at the rate of a million a year, which, added to the quarter of a million now annually available from the receipts of the Forests, will result in opening up many regions now inaccessible. While the selection of the roads may be primarily for general development purposes, nearly every new road will greatly add to the recreational use and development of the Forests.

Of great importance as a recreational feature to attract the visitor is the wild life of the National Forests. Through the help of the Bureau of Fisheries and the state hatcheries a great deal is being done to maintain the fish in the numerous mountain streams, and with excellent results. The game problem is a more difficult one. The game is far less than should now be produced in the Forests. Restricted authority has prevented the Government doing what is obviously desirable and necessary in order to restock depleted areas. There is still, however, a good deal of game at certain points, and I hope that it may be possible to secure authority to go forward with the plans which have already been formulated to increase the game supply. Of special interest are the elk herds in the Yellowstone region and the Olympics, and the remarkable moose of the Kenai Division of the Chugach Forest in Alaska. Other elk herds occur in Montana, Colorado, and Arizona. Small bands of sheep range the rugged portions of many of the Forests, and in some places they are increasing under prohibition of hunting; and at numerous points deer and other game are still fairly plentiful. But we hope that the opportunity may be given us to take the steps necessary to restock the depleted areas that could carry abundant game (and that is possible without interfering with the livestock industry), so that practically all the Forests will produce both big and small game. These would be an added resource valuable in itself, and a special attraction to the visitor, to the real sportsman and to the increasing number that now hunt with the camera.

In considering the recreational features of a large forest tract one is apt to think first of the points of special scenic interest, such as lakes, mountain peaks, a certain bit of forest, and so on. Of course such areas will be central points of attraction and perhaps visited more than any other portions of the Forest. At the same time every portion of a public Forest furnishes some recreational feature which must be considered in a broad plan of recreational development. As soon as the visitor enters a Forest he encounters some activity of interest from the public standpoint. It may be the protective system, with its roads and trails, telephones, lookouts, tool and food caches, etc.; or nurseries, or plantations; or timber sales in actual operation; or mines; or water-power development. The Forest system is a great public enterprise, and the visitor is almost invariably interested in seeing how the Forest activities are being conducted and what public results are being secured.

In working out the recreational development there are involved many technical problems. In our road building we have the service of the engineers of the Office of Public Roads. In the game problems, the Biological Survey experts are available for advice and assistance. Problems of landscape and sanitary engineering present themselves in large numbers, and we have associated with us a distinguished landscape engineer to guide our work, each step in which counts large and must be taken right.

An important aspect is the correlation of the work on the several Forests with that of the National Parks, which in many cases are surrounded by National Forests or are adjacent to them. We seek to coördinate the Forest road and trail systems with those in the Parks. The systems of scenic highways should be comprehensive in character. They should comprise the National Parks, the scenic points in the National Forests, and the scenic points in the forest and park systems of states and municipalities, and even those privately owned. It is all a part of the broad policy of making the public recreation resources of real service to the people. The returns of such service are very real and greater than can be measured.

CONSERVATION OF GAME IN THE NATIONAL FORESTS AND NATIONAL PARKS

BY E. W. NELSON,
CHIEF, BUREAU BIOLOGICAL SURVEY

LONG after the increasing population of the eastern United States had forced the elk and the bison across the Mississippi, the boundless open plains and forested mountains of the West swarmed with a primeval abundance of game. All are familiar with accounts of the millions of bison, antelope, elk and deer which ranged the great plains and the Rocky Mountain region within half a century, and a writer traveling through the San Joaquin Valley, California, in 1850, records seeing "bands of elk, deer and antelope in such numbers they actually darkened the plains for miles and looked in the distance like great herds of cattle."

The resistless westward advance of settlement continued and now the agricultural lands from the Atlantic to the Pacific are peopled, and where crops cannot be grown the watering places are held for the use of multiplying herds of cattle and sheep. Under these conditions not less than 90 per cent of all the big game remaining between the Mississippi Valley and the Pacific Coast has been forced to retreat to the mountains traversing that vast region. There among the rugged peaks and forest-covered slopes which characterize our remaining wilderness are sheltered the survivors of the wonderful hosts of big game animals which once graced so large a part of the continent. Fortunately the major part of these mountain lands, not being available for agriculture, have remained, and are likely to continue, a part of the public domain.

From Biological Survey.

BISON ON THE FEDERAL BISON RANGE AT DIXON, MONTANA

Within the memory of many now alive there were hundreds of thousands of buffalo in the West, but their indiscriminate slaughter for beef and hides has resulted in their almost complete disappearance.

At present the situation as to game control in the West is extremely chaotic. The game there is practically all concentrated on that part of the public domain included in the National Forests, National Parks and National Monuments. On the National Forests two Federal game refuges exist, the Grand Canyon and the Wichita, where game is protected under Federal law. In addition, state game refuges have been made on the National Forests in six states. On these state refuges, as elsewhere on the National Forests, state game laws prevail, though the authority of the Federal Government controls the timber and grazing.

In the sixteen National Parks the Federal Government has full authority to protect game in only seven: the Yellowstone, Glacier, Mount Rainier, Crater Lake, Platte, Hot Springs, and the Hawaiian. The states have not ceded jurisdiction for the other nine parks and in the absence of Federal legislation the Federal authorities can punish poachers there only by expelling them from within the park limits. Of the 34 National Monuments, 21 are administered by the National Park Service, 11 by the Forest Service, and two are under the jurisdiction of the War Department, but the game on them remains subject to state jurisdiction.

To add to the confusion, the states have many varying and conflicting laws which often produce unhappy consequences for the game. Furthermore, in many of the states where the laws appear to give a fair degree of protection, through lack of funds, or for other reasons the protection is extremely ineffective. The fact that game is steadily decreasing in a large part of the West while the number of sportsmen is increasing is indicated by the fact that in the regulations under the state laws there is from year to year a decrease in the number of game animals a hunter is permitted to shoot in a season.

Throughout the West where elk, antelope and mountain sheep were once so plentiful and widely distributed,

elk may be legally shot in three states only; mountain sheep in two, and the hunting of antelope is generally prohibited. In five states west of the Mississippi River deer hunting is entirely prohibited; in eight the limit is one deer to the hunter a year; in five states the limit is two deer; in two states three deer, and in Louisiana the limit is five.

In Arizona, one of the last states where frontier conditions prevailed and in which there is a great extent of superbly forested mountains and plateaus, affording ideal conditions for game, the native elk was exterminated nearly twenty years ago, the antelope and mountain sheep are so nearly gone that there is a permanent close season on them, and there is a bag limit of one deer a year to the hunter.

Photograph by Albert Schlechten.

MULE DEER IN YELLOWSTONE PARK

Intelligent protection and restocking of ranges may restore these deer in large numbers. Colorado has successfully reintroduced elk and has largely increased the almost exterminated mountain sheep.

The idea of game conservation in the West extends back less than 30 years, and there, as in most comparatively new regions, many people long retain the feeling that wild game belongs to whoever can take it, a survival of the point of view of more primitive times. It has been the history of all new regions that the pioneers depend on game as a source of food supply and kill it freely at all seasons. No thought is given the future until, with the increase of population, the number of animals killed so far exceeds the natural increase that the supply is rapidly destroyed. It is evident from what we know of past and existing conditions in a large part of the West that, although the sentiment for protection is increasing, game will continue to disappear unless some wiser and more effective method than now exists is put into operation, not only for its protection, but for its perpetuation and increase.

The National Forests are patrolled by rangers of the Forest Service of the Department of Agriculture, and the National Parks by rangers of the National Park Service of the Department of the Interior. For some years the Forest Service has been making a careful survey of game conditions in National Forests and is well informed as to the existing situation. It is well for the remaining wild life of the West that the men in charge of both forests and parks are deeply interested in its conservation.

It is evident that wild game inhabiting a National Forest is as much a natural asset of the forest as the annual crop of grazing or of the timber. Up to the present time our attitude has been that it is something entirely apart and subject to entirely separate control. This has been unfortunate for the game. With the example before us of the efficiency shown by the Forest Service in safeguarding from spoliation and making useful to the public the resources of grazing and timber in its custody, it is evident that if it were given guardianship over the game on the forests the results would be of far-reaching importance. The trained corps of forest rangers and guards can and do now serve with practically no extra cost as wardens over the game, and a practical constructive program could be developed, not only for conserving the game, but for restoring it to areas where it has disappeared, and in increasing the supply to the full capacity of the available summer and winter grazing. The control of the grazing of cattle and sheep on the National Forests being in the Forest Service, gives that organization the absolutely essential knowledge of summer and winter grazing conditions that is required if the game is to be safeguarded. The use of the forests for domestic stock will continue on a great scale, but with good management great numbers of game animals may exist in the same forests.

Photograph by Albert Schlechten.

WHITE-TAILED DEER IN YELLOWSTONE PARK

In five states west of the Mississippi River deer hunting is entirely prohibited; in eight the limit is one deer to a hunter a year; in five states the limit is two deer; in two states it is three and in Louisiana it is five.

In a program for rehabilitating the game resources of the National Forests, where there is abundant room for an enormous number of game animals without seriously interfering with the present livestock industry, three things are essential:

(1) A series of national game preserves located in favorable situations and distributed in National Forests throughout the West in order to provide breeding sanctuaries where game may increase and supply the surrounding areas.

(2) Coöperation between the Forest Service and the states wherein National Forests are located, whereby the Forest Service shall designate the parts of the forests where hunting may be done and the number of animals that may be killed in any particular forest or section of forest each season, the states meanwhile to have full control over issuing hunting licenses and to receive all fees therefrom. The states would thus benefit by the services of the trained force of forest rangers and guardians acting as Federal game wardens to guard the game resources from spoliation just as they now protect the trees and the grazing in the interest of the country at large.

(3) A coöperative arrangement between the Forest Service and the National Park Service whereby the game service in the National Parks and the National Monuments shall be coördinated with that of the Forest Service to the same end, that the game supply may be increased and perpetuated.

The necessity for this mutual coöperation is evidenced in the elk situation in the Yellowstone Park. Within the park there is a superabundance of summer grazing where several times the present number of elk can find abundant forage for all time to come. The high altitude of the park and the severity of the winters there are such that winter grazing is limited, particularly in severe weather, necessitating that a large proportion of the elk pass outside the limits to secure sufficient forage. The park is surrounded on all sides by National Forests on which the forester is authorized to grant grazing permits for livestock. The increasing settlement of the West and the growing demand for grazing permits indicate that within a comparatively short time there will be a call for every acre of grazing available up to the very limits of the park. Should permits to this extent be granted and the range stocked to its full capacity the areas now available to elk for winter grazing would be eliminated. As a result of this only one or two severe winters would be sufficient to decimate the Yellowstone elk herds. The Forest Service has wisely foreseen the approach of this danger and for several years has been planning to safeguard the future of the elk in this area by reserving a sufficient area for their winter grazing. In order to do this intelligently, however, it is necessary to know the number of elk in the park and the location of the ranges to which they naturally drift in winter. Several counts of the elk herds in the Yellowstone have been made, and an arrangement effected whereby the Forest Service and the National Park Service will make a joint census this month, when the elk are on their winter range, the park and forest rangers

Photograph by Leet.

HOW SHALL THESE ELK BE FED IN WINTER?

The Forest Service and the National Park Service are now making a census of the elk in the Yellowstone Park with a view to providing winter feed for them when the grazing on which they have been depending in the winter is so depleted that it can no longer maintain them. This photograph was taken in early winter at Jackson Hole, Wyoming.

working under the direction of a representative of the Boone and Crockett Club.

With information concerning the winter location of the herds and the number of animals thus made available it will be a comparatively simple matter to delimit the necessary winter range for the elk and reserve it for the use of the elk herds. The elk herd which spends its summer along the southern border of the Yellowstone Park and descends in winter into the Jackson Hole region, is now carried through the stress of severe winter storms by being fed hay on the Jackson Hole winter refuge, which has been purchased by the government in order to care for these animals. This refuge is in charge of the Biological Survey, which has a resident warden there who, each summer, superintends the putting up of more than 600 tons of hay. The available lands on the refuge may be planted and made to yield approximately double this amount of hay when it becomes necessary.

From Biological Survey.

STARVING ELK AT JACKSON HOLE, WYOMING

Before the Federal winter refuge was established by the Government, hundreds of elk died because they were not able to obtain food. The photograph is of a victim of starvation and a survivor.

The refuge and feeding station in Jackson Hole is located on the ancient wintering grounds of thousands of elk and has been necessitated by the influx of settlers who have taken up a large part of the former wintering ground of the elk for farming and stock raising purposes. The available summer grazing for this herd, which numbers over 20,000 animals, is abundant.

In order to carry out the conservation program for game on National Forests outlined above it will be necessary to secure Congressional action to set aside game refuges on the forests.

As soon as the plans suggested above are well understood, the states will no doubt join in coöperation to secure the benefits which would flow to them from such an arrangement. They would thereby secure the protection and increase of their game resources with no added cost to themselves and with no added burden of wardenship. By this arrangement the rights of the states to legislate for the hunting of its game, making seasons, licenses and other essential features would still remain with them; the only check would be to prevent the waste of their game resources.

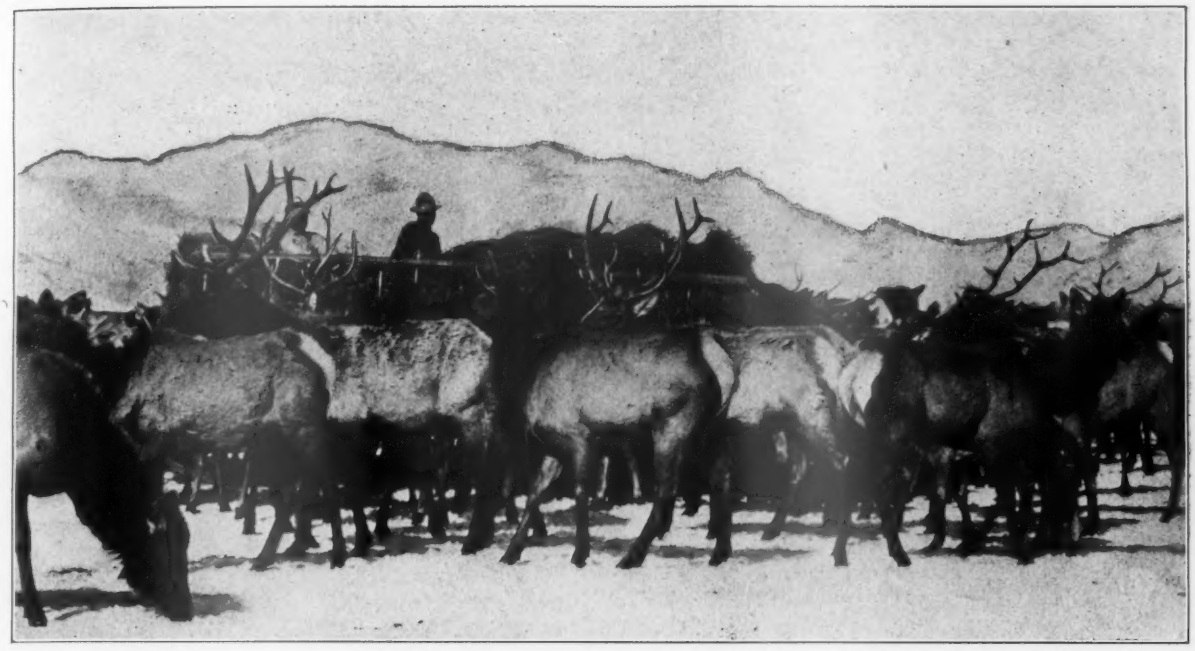
With the series of game refuges and control of the game on the forests as outlined above it will be a comparatively simple matter to restock or breed up game on nearly all of the National Forests to a reasonable abundance. Deer, elk, and possibly mountain sheep, may be restored to the point where excellent hunting may again be obtained, although, of course, never on so large a scale as was possible in the early days. Experiments in restocking ranges have already been made on a sufficient scale to show how simply and easily this may be done under proper conditions.

A herd of about 70 elk introduced a few years ago from the Yellowstone Park to the Sitgreaves Forest in Arizona has thrived amazingly and in a few years will undoubtedly restock a large area in that region. In Colorado elk have been successfully reintroduced, and, under stringent protection due to local sentiment, mountain sheep which once were on the verge of extermination have bred up in considerable numbers.

A few years ago Alaska contained some of the finest hunting grounds in the world. The giant moose with the noblest antlers of any of the living deer kind existed in astonishing abundance. The snowy white mountain sheep, noted for its gracefully formed horns, was extremely numerous in many places, and caribou of several races roamed the tundras and scanty interior forests in countless numbers. During the last 15 years all have tremendously decreased, mainly through over-shooting to supply the miners' camps and for dog food. Now the Federal Government is building a railroad from the south coast into the interior to develop the resources of that territory, but the thousands of men employed in its construction have created a demand for meat which is threatening the annihilation of the superb game animals of a belt more than 150 miles broad right through the finest remaining game country; thus at the outset the railroad may become responsible for the destruction of one of Alaska's most valuable resources.

In an effort to stay this ill-judged slaughter the Secretary of Agriculture, under authority vested in him, has issued a regulation prohibiting the sale of game killed on the Kenai Peninsula and adjacent region, but the proximity of the new road to this splendid game field and the number of possible hunters make the outlook there dark for the many moose and mountain sheep.

National Forests in Alaska cover not only the Kenai Peninsula, but also the heavily wooded islands along the south coast, where the Sitka deer lives in great abundance and has been killed in large numbers for commercial purposes. In all this region occur representatives of the huge brown and northern grizzly bears, the largest living carnivores of the world.



From Biological Survey.

FEEDING ELK IN WINTER AT JACKSON HOLE, WYOMING

This winter refuge for elk is now owned by the government. Hay is grown in the summer and some 600 tons are stacked for the winter use of the 20,000 elk in the herd.

In addition to the game the National Forests also shelter another natural asset in the fur-bearing animals such as the beaver, mink, marten, fisher, wolverine and fox, which under proper protection will continue indefinitely to yield a yearly revenue, but which will be completely destroyed if neglected. Beaver are already gone from most of their former haunts, but can be readily restored on many forests. The other species named are becoming steadily less numerous. It would appear reasonable that the same authority covering the game animals should cover the fur-bearers.

For several years efforts have been made to secure authorization from Congress to establish a chain of game refuges on the National Forests as mentioned above. A bill now before Congress provides for the creation of a system of Federal game refuges on the National Forests in all parts of the West. Unfortunately this bill has been amended so as to destroy its effectiveness, and apparently it will require further time and effort in order to secure this most desirable and necessary legislation, if our game is to be properly safeguarded.

ALASKAN WHITE MOUNTAIN SHEEP

The opening up of Alaska, particularly now that a railroad is being constructed, will naturally, as it makes travel more convenient, result in increased hunting of the fine game there. There should be proper protection for the mountain sheep as well as the other game.

But for the creation of the Yellowstone National Park and the guardianship assumed by the Federal Government over its wild life, there is no reason to doubt that the two great elk herds now centering there, and containing some 40,000 of these splendid animals, would to a great extent have shared the fate of their kind elsewhere. This is true despite the fact that about one-half of these animals only touch the southern part of the park in summer, and winter outside it. Their fate would probably have been no happier than that of the Colorado herds without the protection and moral influence

exerted by the preservation of the animals in the park and the constant increment to their number from that source. In addition the usefulness of this park to the game supply of the country is well shown in the fact that during the last five years over 1700 elk have been shipped from there and from Jackson Hole for restocking the ranges in 20 states, which were formerly the home of elk but where they had been nearly or quite exterminated.

From Biological Survey.

ANTELOPE IN THE WIND CAVE NATIONAL GAME PRESERVE

This is at Hot Springs, South Dakota, and there should be many more like it. The hunting of antelope in the United States is now generally prohibited.

In addition to its notable service in saving the elk, the Yellowstone Park has protected in its native home the last small herd of buffalo that has continued to exist in its original home in the United States.

Another most interesting and valuable result of the protection of game in the Yellowstone has been the preservation from destruction of a moose peculiar to that region. These moose once occupied a considerable area, but the survivors are now reduced to about 1500 in the park and a much smaller number in the immediately adjacent country on the south. There are also within the park limits several hundred antelope and mountain sheep.

With its thousands of herbivorous mammals, the Yellowstone contains wolves, mountain lions, black and grizzly bears, animals among the most notable and interesting of American large game. This park, with its wealth of wild life, has been a wonderful object lesson in game preservation which, as a precedent, has had a powerful influence in encouraging the setting aside of other wild life sanctuaries, both Federal and state.

The interest of the visitors to the Yellowstone in its game animals evidences the strength of the attraction which wild life has for all. Despite the scenic beauties and natural wonders of this park, the presence of thousands of game animals in their native haunts is widely advertised as one of its most notable features. There is scarcely a well-informed man, woman or child in this country who does not know something of the Yellowstone bears and their free and easy manners.

Glacier National Park is also a game sanctuary where, under government protection, elk, mountain sheep and mountain goats add greatly to the interest excited by the grandeur of the scenery.

For many years there was no Federal law protecting game in the Yellowstone until, in 1894, a poacher wantonly killed a number of buffalo for trophies. This outrage resulted in the prompt passage by Congress of the necessary law, since which time the park herds have been safer from lawless hunters.

It is hoped that in the near future California will cede jurisdiction over the National Parks within her boundaries and thus enable the Interior Department to exercise complete guardianship over the game in Yosemite and Sequoia National Parks. While the variety and abundance of large animal life there can never equal that in the Yellowstone, at the same time the numerous black bears and deer which frequent the wooded lower slopes, and the mountain sheep peculiar to the high Sierras, will add the finishing touches to the marvels of this wonderful area of tremendous mountain peaks, rushing torrents and magnificent forests.

From Biological Survey.

ROCKY MOUNTAIN SHEEP IN YELLOWSTONE NATIONAL PARK

If there is a series of game refuges and proper control of the game it will be a simple matter to restock or breed up game on the National Forests to a reasonable abundance, so that excellent hunting of even such species as the Rocky Mountain sheep may be obtained.

An Act creating the Mount McKinley National Park,

in Alaska, has recently been passed by Congress. This establishes one of the finest and most needed game preserves on the continent and provides protection for a large number of mountain sheep, moose, and caribou in one of the greatest game districts of the world. The government railroad which is being built from the coast to the interior of Alaska passes near, and unless the park had been created by the present Congress there was extreme danger that hunters for the railroad camps would exterminate the game in this section.

Considering the interest in this magnificent mountain, the greatest in North America, the extermination of the superb game animals about its basal slopes and immediately outlying mountains would not only be a calamity but would discredit us to those who come after. It is most gratifying to learn that local sentiment in Alaska is strongly favorable to the creation of this splendid National Park and game refuge, even many of the market hunters having expressed their approval. With the increase of population in Alaska, game conditions there are in specially critical condition since the severe climate renders it nearly or quite impossible to restock its game fields once the game is exterminated.

From Biological Survey.

THE GREAT ALASKAN MOOSE

These fine animals with the noblest antlers of any of the living deer kind in the world formerly existed in astonishing abundance in Alaska, but now are steadily decreasing in number, and with the opening of railroads will, unless protected, be practically exterminated.

The National Monuments contain many game animals under state jurisdiction. The two most notable of these are the Olympic Monument in Washington, which includes the Olympic Mountains and a few thousand of the Olympic elk, the main survivors of this elk which is peculiar to the humid forests of the Northwest coast region and was once widely distributed therein, and the Grand Canyon Monument, taking in a part of the Grand Canyon of the Colorado and including most of the surviving mountain sheep of that region.

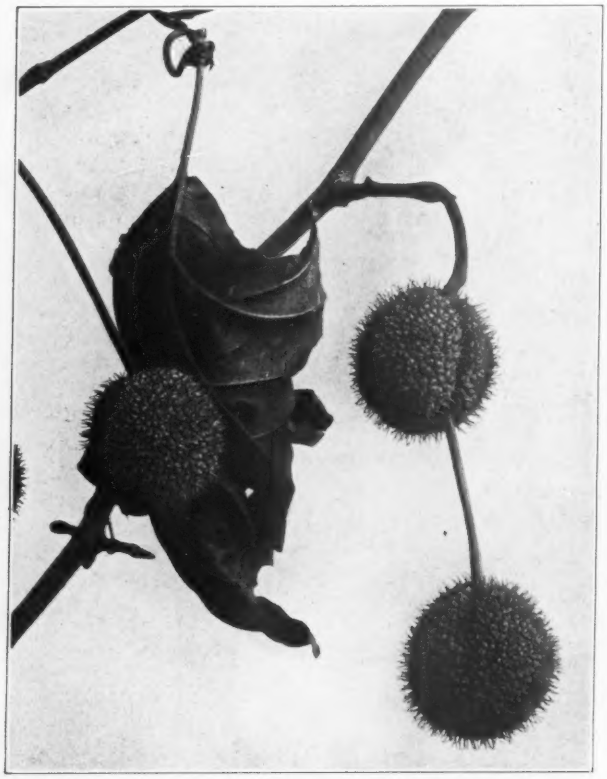
Game is not only an asset of great value from its return in food and skins, but its recreational value in attracting people to the wilderness has long been recognized. The value of game from the latter viewpoint will become increasingly great as the country becomes more densely populated. A host of men and women each year go to the woods for varying periods for the purpose of renewing their mental and physical vigor, and to a great number of these the wild life is the magnet which draws them. It is impossible to estimate the tremendous return which is derived in this way from the presence of wild life in our forests.

In this connection it is interesting to note the changes which have occurred in man's attitude and relation to wild animals. In primitive times his interest was that of a hunter towards his prey. As he developed, his whole existence for untold ages was interwoven with and largely dependent upon that of the wild life about him. To study the ways of the beasts and qualify himself for their capture was his chief safeguard against starvation. A vague feeling of fellowship led primitive man to endow wild animals with mysterious powers and out of his relation with them grew up his mythology, traces of which still survive in our folk tales. But the day of the hunter has in large degree passed and we are now developing a deeper and kindlier sympathy with these habitants of the wilds and welcome their presence as the living expression of the spirit of the wilderness. This sympathetic pleasure in the presence of wild animals in the forest is shared alike by men, women and children, by those who hunt with the gun or camera and equally by a multitude of others, who find some of the most exquisite joys of life in the forest and in the study of its shy habitants.

SYCAMORE OR BUTTONWOOD TREE FLOWER

By Dr. R. W. Shufeldt

OUR buttonwood or buttonball tree is also widely known as the sycamore, and in the eastern parts of the United States it is a familiar shade-tree in nearly all cities and towns. Tournefort, the distinguished French botanist, gave it its generic name, calling it *Plantanus* from a Greek word meaning broad, he being impressed with either the breadth of its shade, or with its broad leaf. Its specific name is *occidentalis*, which was bestowed upon it by Linnæus. There is still another vernacular name for it—the plane tree. It ranges from Maine to northern Vermont, thence westward to Minnesota and Ontario, and southward to Kansas. Magnificent examples of it occur in the valley of the Mississippi and elsewhere in the mid-United States; in fact, it is the largest and tallest tree in the forests of the Atlantic tier of states. Sycamores on some of the western rivers attain the height of nearly 140 feet, while those a hundred feet high were not at all uncommon. As these immense trees age, their trunks become hollow, forming fine homes for squirrels and bees.



THE FLOWER OF THE SYCAMORE TREE

Rare condition of the flower-heads of the sycamore tree, *Plantanus occidentalis*.

The familiar flower-heads of this tree are subspherical balls of about an inch in diameter. These are green in fall and summer, but turn a darkish-tan in winter, at which season they form very striking objects in the leafless trees, each ball being suspended by a long peduncle from the twig supporting it. In big trees as many as five or six hundred of these balls may swing there nearly all winter. As a rule, these flexible peduncles bear but a single button or ball at the free end; but in extremely rare instances there may be two, as shown in my reproduced photograph illustrating this article. When I was a small boy I discovered one of these abnormalities, and I never forgot it. Many a time since I have peered up into sycamore or plane trees in the hope of discovering a second example; but all to no purpose. Among the unnumbered thousands I have seen of them since that day, I have never discovered another like the one I collected over half a century ago in southern Connecticut.

During the latter part of November, 1916, my wife, while walking alone near the National Zoological Park in Washington, observed one of these two-ball abnormalities on a medium-sized sycamore; next day I secured the specimen and photographed it natural size. It will be seen that the peduncle of the upper ball is not more than half the usual length, while that of the lower one is somewhat longer, though not as long as in the case of the normal ones on the same tree. Its proximal end appears as though it were sunk into the side of the upper ball; but whether the peduncles are continuous or not I am not prepared to say, as I have not broken up the upper ball in that I might ascertain the fact. In all probability they are continuous; but it would destroy the specimen to thus investigate the structure.

In some instances the tendrils of a grape-vine had twisted about the stems of some of the leaves of the tree, holding them fast so they could not fall to the ground when all the others did. A case of this kind is also shown in the illustration. The dilated base of the petiole is seen just above where the tendril of the vine has seized the stem, and on the twig of the tree above it is also seen next season's bud, which was covered by the aforesaid dilated petiole, where the leaf grew in position on the twig. This peculiarity is rare among trees.

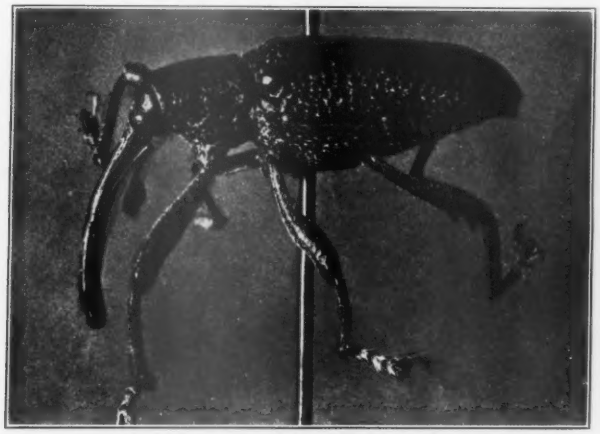
MICHIGAN TO PLANT 4500 ACRES ANNUALLY

BY asking the Legislature to increase its annual appropriation to $150,000, the Public Domain Commission is preparing to carry into effect one of the largest forest conservation or tree planting plans which has ever been tried in this country. The plan has the backing of the members of the Commission and is also approved by the forestry experts at the University of Michigan and the Michigan Forestry Association. The state now owns, in round numbers, 540,000 acres of land. It is proposed to plant trees at the rate of 4500 acres per annum and, in what is known as a period of rotation ,consisting of 60 years, all of 270,000 acres can be planted. One-half of the other 270,000 acres will in the next 30 years, under protection, produce sufficient material, which by cutting will clear a gross revenue of $15 per acre. Beginning with 1947 it is thought advisable, according to the plan, to cut at the rate of 4500 acres per annum and plant at the same rate with the more valuable pines. By 1977 the remaining 135,000 acres will be treated in a like manner, so that the initial restocking of all forest lands will have been completed in 2007.

SAVE US FROM INVADING PESTS

BY J. G. SANDERS,
ECONOMIC ZOOLOGIST OF PENNSYLVANIA

THE majority of our citizens should be so well informed regarding the pernicious practices which now obtain in the United States, whereby an open door is maintained for the introduction of immense quantities of infested and infected plant material, that argument for the limitation of this evil would be unnecessary. But I have eminent reasons to believe that not all who are interested in the promotion and maintenance of agricultural and horticultural health have fully sensed the present



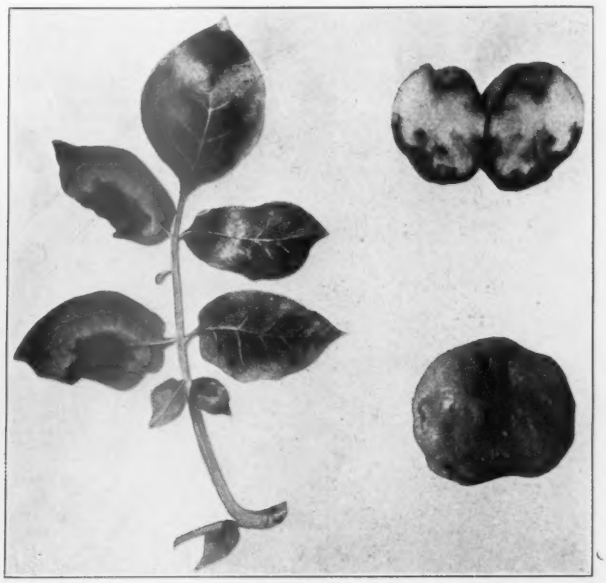
AVOCADO WEEVIL

The Avocado Weevil seriously injures Avocado seed in Mexico and Central America and has been frequently detected in seed from these regions. To protect the Avocado interests the Federal Horticultural Board has quarantined all seed from Mexico and Central America.

pitiful condition of these interests in our country, nor do I think all of us realize the many dangers which threaten our welfare with every shipload of foreign plants discharged on our shores.

If every teacher and student of the practical sciences, and every member of our many agricultural experiment stations were fully cognizant of the history of plant pest introduction into America, and of the untold millions lost annually through their ravages, it would seem that sufficient publicity could be given the facts to awaken careless America to remedial action. I have used the expression "careless America" advisedly yet truthfully. We Americans are subjects of derision by foreign nations, on account of carelessness in many phases of our national and economic life. Our coasts are inadequately guarded from human invasion, aided by powerful machines of war, and there is but little doubt that charts and plans of many of our coast defenses, and full reports of our vulnerable seacoast are reposing in the vaults of foreign nations.

These foregoing statements are preliminary to a recital of needed forms of defense against enemies of plants, which are threatening the food product possibilities of our



LATE BLIGHT OF THE POTATO ON THE LEAVES AND THE TUBER ROT WHICH FOLLOWS IT

This is one of the most serious of all potato diseases. It is almost constantly present in the humid North of both Europe and America and was the direct cause of the famous Irish famine. The disease is readily controlled by Bordeaux mixture.

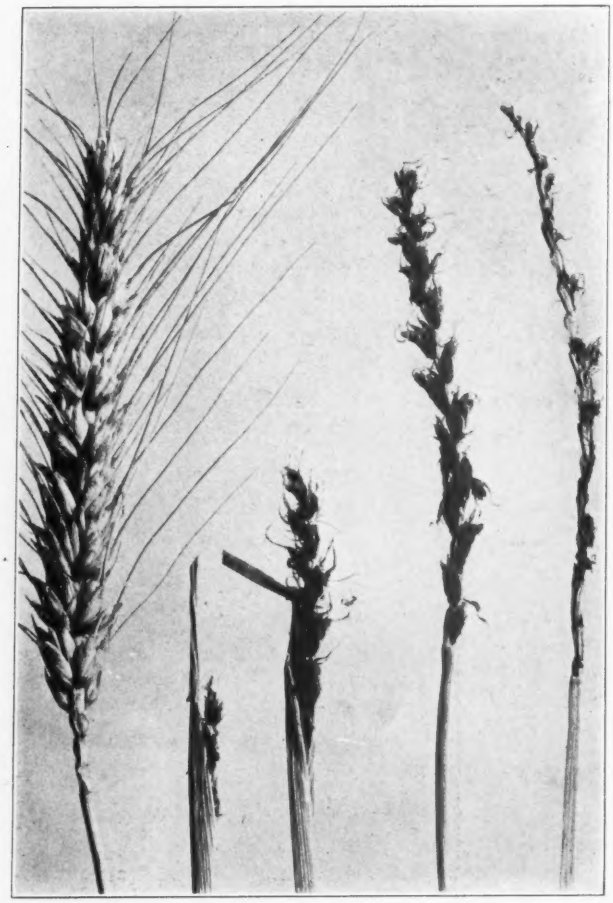
country, just as surely as similar enemies in the past have entered and attacked our agriculture and horticulture, destroying each year several times the total annual appropriations for our army and navy. As the speed of ocean travel lessens the transportation period and increases the frequency and facility of shipments from abroad we cannot expect a diminution of the danger of plant pest

SPREAD OF THE BOLL WEEVIL

The lines show the progress year by year of the boll weevil which has already done millions of dollars' damage to cotton.

introduction in the future. Our judgment from past experiences warns us of even greater evils to come.

Unwise persons have asserted that soon we will have imported all the pests which threaten us, and this danger will have passed. Impossible! No one cognizant of the multitudes of dangerous insects and plant diseases throughout the world as yet unreported in this country would accept an hypothesis. Just as a wise physician can diagnose a dangerous disease in its incipient stage, or can foresee an epidemic, if quarantine regulations were abandoned or unenforced, so can a plant physician and entomologist foresee calamity to agriculture in its various branches, when precautions are ignored, and dangerous pests permitted entry and establishment.

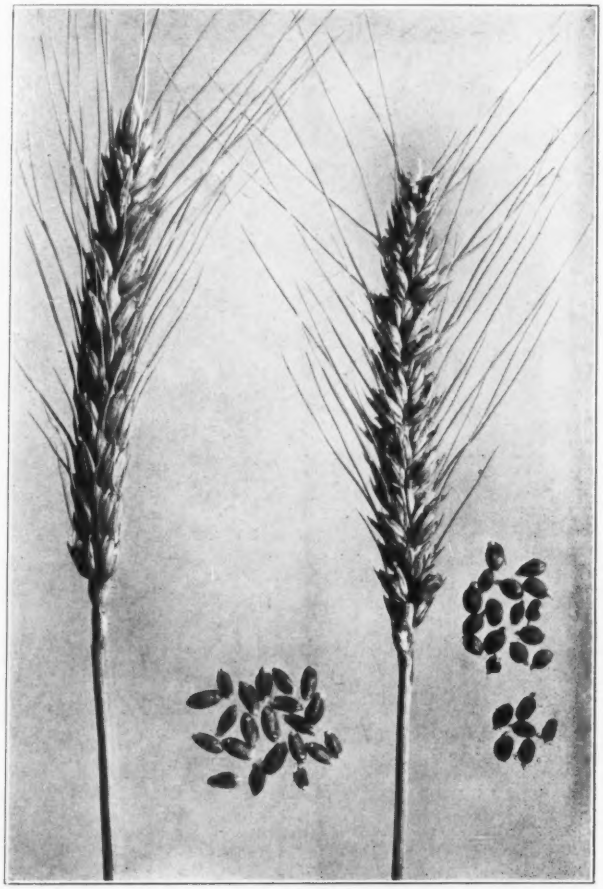


LOOSE SMUT OF WHEAT

A wide-spread though generally much less destructive smut than bunt. It causes an estimated annual loss of $7,735,000 to farmers of the United States. It can be prevented by hot water treatment. Infection occurs at flowering time.

Unknown dangers lurk in every shipment of plants to America from foreign lands. Even though it might be humanly possible to inspect them for known foreign pests, certain insects and diseases which may be insignificant in their original native surroundings, when introduced into new territory without their natural enemies and checks, and, perchance, finding new and more pleasing host plants, will multiply with startling rapidity, and soon become destructive pests. The chestnut blight, white pine blister disease, the citrus canker, cotton boll weevil and San José scale are notable examples of development under these circumstances. Every plant-feeding insect has the inherent valency of a destructive pest.

Nature conserves the balance, which too frequently is disturbed by commerce and agricultural practices of civilized men. The pristine condition of America from an agricultural standpoint was ideal for the production of amazing crops at low cost, on account of the paucity of destructive insects and plant diseases. Could our plants and seeds have been introduced without the attendant diseases and insects, we might to-day have been growing potatoes free from late blight and rot, powdery scab and scurf, and there would have been no necessity for the autumn reduction of the midsummer estimates of the potato crop by our Federal Agricultural Department by millions of bushels, occasioned by uncontrolled ravages of the late blight and rot in 1916. The potato, like certain other of our agricultural products, was introduced from abroad, and in the absence of the introduced pests and diseases our crops would be fully returned.



BUNT OR STINKING SMUT OF WHEAT

This is controllable by seed treatment. It causes an annual loss of $54,000,000 to farmers of the United States. A wide-spread disease spread by planting smutty seed and in some sections by winds and smutty heads left in harvested fields. Crushed smut balls smell like decaying fish.

Since the organization of the Federal Horticultural Board, and the subsequent inspection of imported plant

material, 508 distinct species of insects, and 189 distinct plant diseases have been intercepted on plant imports from abroad. It is safe to presume that a considerable number of these would have developed to the stage of serious and destructive pests, if we may judge from performances of similar introductions in the past. By no means, however, has our inspection been able to prevent the introduction and establishment of numerous insects

a *b* *b* *c* *c* *c*

BARLEY INFECTED WITH DISEASE

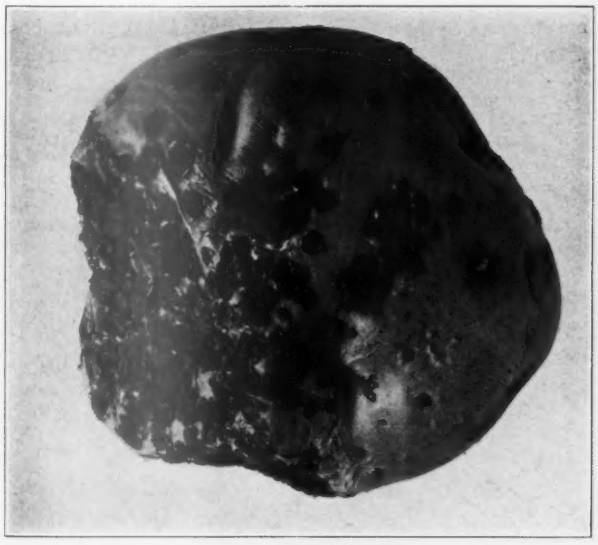
(*a*) A sound head of barley.
(*b*) Two heads affected with covered smut, an easily prevented disease which causes an estimated annual loss of $2,100,000.
(*c*) Three heads affected with loose smut, a disease preventable by hot water treatment. Causes annual loss of $1,225,000 to the farmers of this country.

and diseases, some of which may even now be established and are rapidly multiplying, but as yet have not attracted the attention of the scientists.

A list of the introduced insect pests and plant diseases, which have become established in this country, would be too extensive and lengthy for consideration at this time, but I will enumerate a number of the more important ones, and I am sure that you will recognize a large number of those pests which we consider of prime importance in America.

It is my rather hasty determination that approximately 75 per cent of the major insect pests and plant diseases of the United States have been introduced from abroad. Surely some of the most destructive ones are in this category.

Among the many plant diseases which have probably been introduced, and are now demanding serious consideration are the asparagus rust, alfalfa leaf spot, bean



POTATO POWDERY SCAB

A disease probably originating in South America, carried from there to Europe, and thence to Canada and the United States—at one time the cause of serious alarm and a temporary quarantine. It has fortunately turned out to be a disease of cool, moist climates, and unable to spread in most parts of this country.

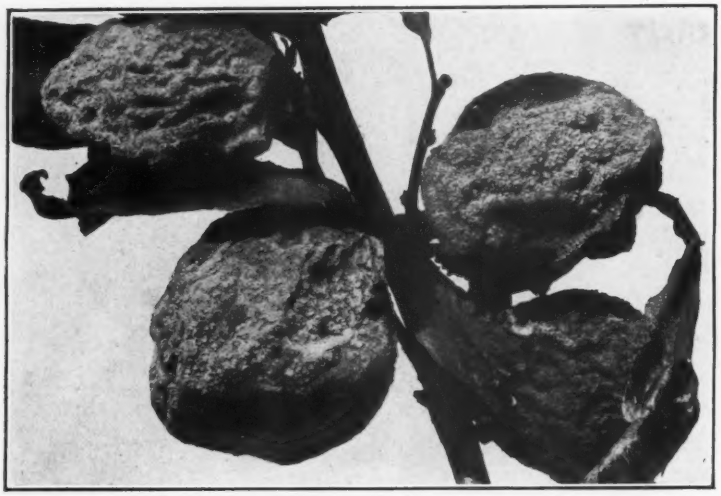
anthracnose and rust, European apple canker, apple scab, pear scab, brown rot of various fruits, the downy mildew of cruciferous plants, the chrysanthemum rust, chestnut blight, diseases of cotton, carnation rust, the hyacinth disease, the hollyhock rust, the loose smut of oats, the olive knot disease, the peach leaf curl and peach scab, ergot affecting rye and allied cereals, violet rust, loose smut and rust of wheat and other grains. Also, those recently introduced diseases, the white pine blister canker, the citrus canker and the poplar disease.

In this list those of you familiar with plant diseases have noted a large number of our serious plant pests; those more familiar with the insect pests will recognize, in the few which I have listed, some of the most serious creatures ever introduced into this country—the San José scale, the fluted scale of citrus, the oyster-shell scale, black scale, red scale of California, red scale of Florida, European fruit scale, European fruit lecanium, cottony maple scale and the tulip tree scale, as well as many other scale insects which are pests in greenhouses throughout the country, the codling moth,

APPLE SCAB

This scab affects the leaves as well as the fruit and reduces greatly the food-making surface of the tree.

Hessian fly, angumois grain moth, the hop plant louse, cabbage worm, several species of weevils affecting peas and beans, three species of domesticated cockroaches, bulb mites, narcissus bulb fly, the elm leaf beetle, gypsy moth, brown-tail moth, leopard moth, cotton boll weevil, the alfalfa weevil and Argentine ant. In this list we find some of our most expensive and costly importations; but by no means have we introduced all which may come to our shores—for there await introduction large numbers of species of insects and diseases, which are known to be pests in foreign countries, and might possibly be much more serious if introduced to America.



BROWN ROT OF THE PEACH

This is a serious disease in the peach growing section of the eastern United States. It may even render worthless the fruit while it is in transit to market.

The question which arises in our minds is a preventive for this amazing and startling condition of affairs, and there seems to be but one method whereby we may eliminate further danger absolutely, and that is by a Federal embargo on the further importation of plants and plant products from abroad. The imposition at once of such an embargo would for a time handicap the nurserymen, florists and seedsmen of this country, but there is no reason to believe that a final adjustment of these lines cannot be effected within a very short time, so that we will not be dependent on other countries for our horticultural products.

Statements have been made by our nurserymen that it is impossible to grow in America plants of such superior quality as are now produced abroad and shipped to this country. This is a debatable question, and will remain so until absolutely serious efforts have been made in America to produce these desired products. The placing of an embargo on the import of horticultural products would ultimately benefit the nurserymen, florists and horticulturists of this country, by eliminating those pests which are gradually being introduced into this country, and just as surely, after due time and opportunity, are injuring all demand for certain kinds of nursery and florists' stock. As an instance, no one in the region now infected with chestnut blight will buy or plant chestnut nursery stock. If the citrus canker should escape control in Florida and ruin the citrus industry, the nurserymen growing citrus stock would have to seek other business. If the white pine blister canker escapes and destroys our white pine as rapidly as it is planted, there will be no demand for nursery stock of this type. Similar examples might be cited in other lines, if so desired.

PEACH SCAB

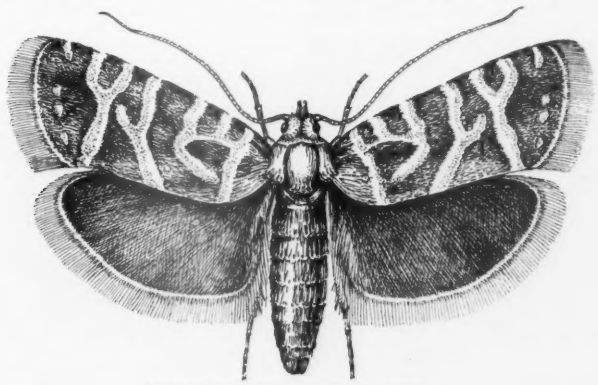
This causes an average loss of 10 per cent of the total value of the peach crop of the eastern United States.

APPLE SCAB

This is the most destructive disease to which this fruit is subject. In unsprayed orchards, it may destroy the whole crop. The total expenditure for spraying in the United States because of this disease is enormous.

The possibility of a Federal embargo being placed on the importation of nursery stock has aroused some of our nurserymen and florists considerably, and they have maintained that an "absolute embargo" would almost ruin their business. Certain of the farseeing, and I may say better informed nurserymen, realize that something must be done to protect their interests from the ravages of pests, and after two or three informal talks with various groups of nurserymen, I am pleased to report that in most cases these men are willing to forego the importation of certain classes of what may be termed "finished nursery products," feeling that they wish to continue the importation of seedling stock for propagation in this country. In

one informal conference with some nurserymen, in which this problem was discussed, there was evidenced the feeling that nurserymen generally would be fairly well satisfied if all "finished nursery stock," including all plants with balls of earth about their roots, were pro-



EUROPEAN PINE SHOOT MOTH
This pest has in recent years been introduced into America on imported pine seedlings and is now established in widely separated localities in the eastern and middle western states.

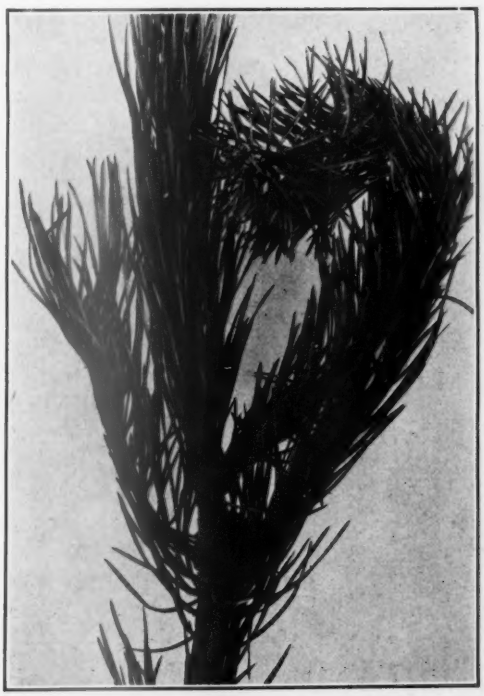
hibited, and permission given to import (1) fruit tree seedlings; (2) 2-year seedlings, cuttings, buds or grafts of ornamental shrubs; (3) deciduous shade, ornamental and forest trees not to exceed six feet; (4) coniferous evergreen stock not to exceed eighteen inches, except 5-leafed pines, which are prohibited. If a proposition of this sort were maintained and an embargo arranged accordingly, I fully believe that 75 per cent of the present amount of inspection would be eliminated, and, furthermore, this arrangement would eliminate the importation

TWISTED GROWTH OF EUROPEAN PINES
This is a characteristic injury caused by the larvæ of the European pine shoot moth.

of some plants, most dangerous on account of the impossibility of inspecting them thoroughly.

After giving this problem much thought and consideration I feel that I could recommend, without too much injury to the importing nurserymen, an embargo

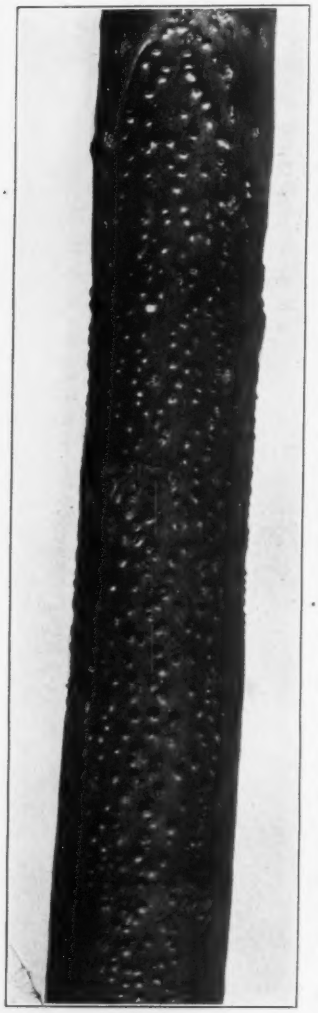
WORK OF THE EUROPEAN PINE SHOOT MOTH
Showing the fall injury to pine buds by young larvæ of the moth. Many buds are thus destroyed, as in America the larvæ have developed the habit of eating out from two to four buds before winter.



ANOTHER FORM OF INJURY
This malformation caused by the larvæ of the European pine shoot moth is so familiar in European pine forests that it has a popular name in each country, as "posthorn" and "waldhorn" in Germany and Holland and "baionnette" in France.

on all importations of plants with earth about the roots, to be enacted as soon as possible, and that a three-year period be allowed for the importation of the classes of nursery stock outlined above, after which all further importations should be prohibited, except importations by the United States Department of Agriculture of such nursery stock as is deemed desirable by said department—this to be grown and propagated under quarantine for a reasonable period before distribution. This proposition doubtless, even though quite lenient, will be opposed strongly by many importers, but the question to be considered is whether we shall continue to permit the importation of a few thousand dollars' worth of plants, any shipment of which may bring in a dangerous pest, which ultimately may cost the country millions every year.

Is it not appalling, in consideration of the long list of imported pests now established in this country, when we learn that $14,293,500 has been spent in New England by Massachusetts and other infested states, with the Federal Government assisting, to prevent the spread of the gypsy moth? These figures do not take into account the immense damage to forests, woodlands, private and public premises, nor the amounts of money spent privately for control of this pest. It would be absurd to attempt an approximate estimate of the total cost and losses entailed in this country by the introduction of the San José scale about 1870. The futility of attempts on a large scale to control an insect pest or a disease, which has once gained a firm foothold in this country, is apparent, for in no case have any such attempts succeeded in this country, nor will they ever succeed under the present system of government, unless very broad, comprehensive power is given to some official board. Our experiences of the past show that the actions taken for control are usually several years behind the advance of the pest.



EUROPEAN POPLAR CANKER

This disease, recently imported from Europe, is doing serious damage to the poplar trees of the eastern section of this country and is spreading westward.

The establishment of an embargo on "finished plant products" would place in the hands of our legitimate nurserymen and growers the very business in which they are concerned, and would eliminate the present baneful system whereby nursery stock of doubtful origin, variety and quality is sold by brokers, dealers and commission houses everywhere. Much of this stock is shipped to this country to be sold on consignment or at auction, and it is oftentimes of such poor quality that it should have been placed on the brush pile in foreign countries. The nurserymen of this country have done little to protect themselves against this practice, but as a matter of fact the step has been taken for them by an agreement recently signed by all but five of the growers and exporters in Holland, binding them to prevent further shipment of nursery stock for sale at auction in this country.

CHESTNUT BLIGHT CANKERS ON AMERICAN CHESTNUT

This disease has practically exterminated the chestnut trees of this country and has caused losses of millions despite efforts to save the trees.

Adam Smith in his valuable treatise, "The Wealth of Nations," says, "By restraining, either by high duties or by absolute prohibitions, the importation of such goods from foreign countries as can be produced at home, the monopoly of the home market is more or less secured to the domestic industry employed in producing them."

Destruction of the nursery and florist's business would not follow the adoption of a limited embargo as out-

lined above, to be succeeded after a short period by an absolute embargo.

Years ago Germany, France, Austria-Hungary, Holland, Switzerland and Turkey prohibited absolutely all entries of nursery stock from the United States. These countries took this step after one severe lesson, viz., the

Photograph by R. K. Beattie.

INFECTED BLACK CURRANT LEAF

The white pine blister disease propagates on currant and gooseberry leaves and then spreads to the trees. This black currant leaf is lightly infected. The orange pustules show as dark spots in the photograph.

introduction of the grape phylloxera from America which ruined their vineyards, but we have had numerous severe lessons in the United States and no adequate measure for protection has been adopted and enforced. Had the United States Government taken similar action, even at that time, this country would now be free from the brown-tail moth, leopard moth, citrus canker, chestnut blight, white pine blister canker, alfalfa weevil and many lesser pests introduced since that time.

Only this year we are informed that an extremely dangerous borer of the twigs of peach, apricot, cherry and plum trees has been introduced into the District of Columbia, presumably from Japan, and having multiplied enormously, has spread for miles around, injuring about 90 per cent of these trees in its path. At this time it promises to be one of the most serious fruit pests ever introduced in this country.

Under the present conditions of inadequate and nearly futile inspection, the importation of pests will be a continuous performance. It is beyond human ability of the most expert kind to inspect plant imports with absolute certainty, and past experience has shown the weakness and failure of our present system. More stringent methods

Photograph by T. J. Horton.

WHITE PINE BLISTER DISEASE

Showing the open blisters on the bark of a young white pine from Wisconsin. This is an introduced disease which is extremely destructive to white pine (five-needled pines). In some cases 100 per cent of the trees in a given stand have been found to be infected.

must be adopted. I firmly believe that there reposes in the educated men of this country a sacred trust that they shall pass on to the next generation the best possible conditions for the promotion of agriculture, horticulture, forestry and public health.

FLATHEADED BORERS ON FOREST TREES

FLATHEADED borers are among the most important of the borers infesting forest trees in the United States. Some mine the leaves, one burrows into the cones, a number bore into the inner bark and outer wood of the trunk, branches, and roots, while the majority excavate oval winding "wormholes" throughout the sound or decaying sapwood and heartwood.

The bark-borers often girdle and kill healthy trees or those injured by fire, floods, droughts, diseases, other insects, or careless lumbering, and at other times weaken trees so that they become easy victims of diseases, other insects, or unfavorable environment. Sometimes when they do not kill the tree outright their work causes dead limbs or twigs, or serious defects, checks, or gum spots to form in the wood, or swollen galls to form on the branches. The wood-borers mine the sapwood and heartwood of the trunk, top, and larger branches and thus destroy or seriously injure a large amount of the tree's most valuable product, its timber. Wormholes will cause the finest grade clear lumber to become unfit for the higher grade uses and therefore unsalable at the higher prices.

SEE SPECIAL OFFER TO MEMBERS, UNDER TABLE OF CONTENTS

BIRDS AND THE CAMERA

BY A. A. ALLEN, PH.D.,
ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

As the present wide-spread knowledge of birds has grown and the study of the living creature has superseded the study of the dried museum specimen, nothing has done more to attract public notice or to maintain and increase interest than has bird photography. With the use of the camera in recording the habits of birds and bringing graphically before the world, not only the birds themselves but their interesting ways and their work

THE FIRST SWIMMING LESSON

The camera gives us glimpses of the intimate life of birds that few persons would have the time or patience to seek out for themselves. The newly hatched Pied-billed Grebe is taking its first swim.

in destroying injurious insects, it is little wonder that thousands of persons have awakened to an appreciation which formerly was impossible. By means of the photographic plate, the lantern slide, and the half-tone reproduction, one is now permitted to see glimpses of birdland that most people have neither the time nor the patience to hunt out for themselves. The photograph and the motion picture now bring to all nature lovers the exultant sensations which before were the special privilege of the naturalist when, after hours of exertion, he at last succeeded in lifting the curtain, exposing for a moment the intimate life of the wild bird.

But the naturalist still gets his reward through sensations a hundred times more poignant than the feelings of those who merely view his pictures, and for this reason: the number of naturalist photographers is ever increasing. With the greater number of photographers and the advance in photographic equipment, standards of photography have been greatly raised, so that to-day the perfect photograph is not only a portrait of the bird, photographically correct and artistically arranged, but it is the one which also depicts more fully and more accurately than any pen picture ever could some incident in the bird's life. Such a picture has scientific value. It is more than a photograph, it is more than a portrait, it is a fact permanently expressed in the most accurate manner possible.

It is quite possible to convey an erroneous impression of a bird by means of the camera either because of the bird's fear or merely because of the limitations of the lens and the fore-shortening that often appears when objects are photographed at close range. To be of the greatest value, the photograph must show the bird in a natural and characteristic pose; it must show the bird's characteristic markings, and the bird must be doing some characteristic thing. The photograph must express the bird to the very best advantage. Unfortunately a relatively small percentage of the bird photographs taken come up to this standard and are perfect in every respect. Even of those

SNAPPED WITHOUT THEIR KNOWLEDGE

A feeding station for photographing birds near a window. The camera is concealed beneath the box at the right and focused on the branch where one sees the chickadee.

taken by expert bird photographers, the majority are faulty, for there are so many difficulties to combat.

First, there is the finding of the nest or the feeding place suitable for photographing, within reach of the camera and in sufficient light unspotted by shadows; then the bird must be tamed or accustomed to the blind and camera; the weather must be favorable with sun but no wind; the bird must come within the much-restricted focus of the camera; and when all these difficulties are surmounted, the photographer must wait until the bird assumes some characteristic pose before making the exposure. Then if the bird is not alarmed by the click of the shutter a good picture will result—provided of course there are no mechanical defects in the camera, shutter, plate holder, or plates and that development is performed correctly. If

all the conditions are perfect and one uses keen judgment as to the exact instant when the exposures are made, and if he is lucky, one plate out of three should yield a perfect picture. Taking wind and weather as they come and nests in all varieties of locations, one can count himself fortunate if he secures one perfect picture out of thirty exposures. This does not apply to feeding station pictures where conditions are much simpler and more easily controlled and where a far greater percentage of perfect pictures can be expected. As it is the object of this article to show how bird photography is done, rather than to depict its difficulties, in order that those who are interested may secure another resource for their leisure hours, we might well begin with this simplest form of bird photography.

The feeding station.—We will assume that birds have been attracted to a feeding log according to the explanations in the December issue of AMERICAN FORESTRY for 1915 and that a number of birds are coming regularly to be fed, either near a window or to a spot in the woods. It is then time to arrange the perch upon which the birds are to be photographed, for in taking bird portraits one soon learns that the field of the camera is extremely small and the focal range very limited. The camera must be focused on a narrowly delimited area and the birds must come to exactly that spot, for a fraction of an inch difference will often ruin the picture. When ready to take the photograph all other food should be removed or covered so as to increase the chances of the bird's coming to the exact spot. It always takes birds some time to get used to a camera, so a box should be kept where the camera is to be placed for several days previously. In fact it is well, instead of using a tripod, to drive a post in the ground as in the accompanying illustration of a photographic station near a window and keep a box permanently in position where the camera can be concealed. When all is in readiness, a thread or a long rubber tube is stretched from the shutter to the window or hiding place and one waits for the bird to come. Even more convenient than the thread or long tube is a device made from the electro-magnet of a doorbell, which, by the use of a couple of dry cells, can be made to trip the shutter even more successfully than the thread.

LESSON IN NEST PHOTOGRAPHY

The floating nest and environs of the pied-billed grebe. In photographing birds' nests one should try to show as much of the environment as possible without making the nest too small.

The camera.—For this type of photography almost any kind of a camera will do—even a kodak with a portrait lens attachment and with no focusing device can be used because the distance from the lens to the spot where the bird will be can easily be measured. The best camera for bird photography, however, is one that has a ground glass for focusing and has a bellows length of at least fourteen inches (preferably more) so that a portrait attachment will be unnecessary. A 4 x 5 size will prove most convenient for all-around work.

The lens.—The longer the focal length of the lens, the better, because it permits one to use the camera at a greater distance, and even when this does not seem necessary it is an advantage because even the tamest birds will jump at the click of the shutter and when the camera is farther away, the sound is not so audible. Telephoto lenses, however, are unserviceable for most bird work because they require too much care when focusing and too much time when exposing. The more expensive anastigmat lenses are the most satisfactory because they permit of shorter exposures, thus decreasing the chances of the bird's moving, and permit of taking pictures on days when the sun is not shining. Any lens, however, is satisfactory when the light is good.

The shutter.—For feeding station pictures and most other work, the ordinary lens shutter working at one-fifth, one-twenty-fifth, and one-fiftieth of a second is satisfactory, although the shutter that makes the least noise is the best. Multi-speed and focal plane shutters which are necessary for flight pictures requiring an exposure of not more than one-eight-hundredth of a second are not necessary here.

The exposure.—In photographing birds or other objects at close range, about double the exposure required for landscape work is necessary. Thus in bright sunlight the correct exposure with the diaphragm at F. 11 or U. S. 8 would be one-twenty-fifth of a second. Birds which jump at the click of the shutter show movement in a one-twenty-fifth second exposure, so it is better to open the diaphragm to F. 8 or U. S. 4 and give one-fiftieth of a second exposure. On dull days the exposure must be lengthened as in other photography and many of the negatives will be ruined by the movement of the bird.

The plate.—Whether plates or films are used is a matter largely of personal preference, although most naturalists prefer plates. For snapshot pictures the more rapid the plates the better, as they will permit of shorter exposures. The above exposure was given for the ordinary plate such as Seed 27, the speed of which is xl. Seed 30, Graplex, or Lumière plates would permit shorter exposures. For time exposures slower plates are better, double-coated plates giving a wider range of exposure and being more dependable.

UNCONSCIOUS OF THE SHUTTER

A chickadee portrait taken as shown in the preceding photograph. He looks as if he was posing and was proud of the fact, but he does not know the camera man is near.

Making the exposure.—In making the exposure one should watch the bird until it is in a good pose and momentarily at rest. Exposures made while the bird is pecking food will usually be blurred. A slight sound will often cause the bird to pause and look up, giving the desired opportunity.

By keeping out food all through the year a series of portraits of many different birds can be secured all on the same log. The author, for example, has secured photographs of nearly twenty species on the same spot in a city yard, and the opportunities elsewhere near a woodland would be far superior. By having the box always in place, even the most timid new arrivals do not realize when the camera is substituted or placed beneath it and one need never waste time waiting for birds to get accustomed to the camera.

We might now proceed to some of the more difficult phases of bird photography. The same equipment with the addition of the tripod will be sufficient for photographing birds' nests and eggs or young birds which prove most fascinating to the amateur photographer. A word of caution is, however, necessary. Young birds should never be removed from the nest nor should they be disturbed just before they are ready to leave. Young birds are never brooded after leaving the nest and unless their feathers are fully developed they cannot stand the rain, the sun, or the cold nights and usually fall victims to the weather or their numerous enemies. Neither can they be persuaded to remain in the nest when once they have been removed unless they are still helpless. One should wait until they have left the nest of their own free will and then catch them.

In photographing nests and eggs one should be very careful not to destroy any of the surrounding vegetation which conceals them. It is usually necessary to press aside a few leaves or even a branch, but these should never be broken and should be carefully returned to their former position when the photograph has been secured. The nest should never be tipped to show the eggs. It is far better to tip the camera by means of a "tilting top" (a device that may be purchased for a small sum), and to push the eggs to the far side of the nest where they will show. In arranging the camera an effort should be made to show the surrounding vegetation and the nature of the retreat selected by the bird so far as is possible. The accompanying photograph of the floating nest of the pied-billed grebe, for example, shows it attached to the weeds fringing a pond—the pond and the woodland in the distance. No better description of the nest and nesting habit of the grebe could be desired.

BEFORE AND AFTER TAKING

Young birds make fascinating subjects for the amateur photographer, especially when the old birds will come to feed them. One should wait until they leave the nest and then catch them.

Photographing the birds at the nest is perhaps the most absorbing phase of the whole field of photography. It requires the greatest ingenuity and skill on the part of the photographer and at the same time brings him closer to the intimate life of the birds than anything else could. It permits him unobserved to view at arm's length the home life of his subject—the solicitude of the parent birds for their young and their little attentions for one another—sometimes humorous, sometimes ludicrous, sometimes almost pathetic.

Even greater caution should be used in photographing

birds at the nest than in photographing nests and eggs, for any change in the immediate environment of the nest will not only make it visible to the birds' enemies but will usually cause the bird to desert, unless the young are full grown and nearly ready to leave. The prime requisite in this kind of photography is some sort of a blind for concealing or disguising the camera. It can be made of branches and leaves just sufficient to hide the camera and tripod, and the shutter then worked from a distance as in feeding station photography, or it can be large enough to conceal the photographer at the same time. This is far the more satisfactory, for one's object should be not only to secure the picture but to learn something new about the bird at the same time. The most satisfactory sort of a blind is the so-called "umbrella blind," which consists of an umbrella strapped to a pole at the right height and a sheet of green or brown cloth hung about the sides—properly fastened and guyed so that it will not shake in the wind. This blind should be put in place—first at some distance from the nest—and then moved gradually nearer, several days often being allowed for the birds to become accustomed to it. The last step is to push aside the leaves in front of the nest so that, when the lens is pointed through a slit in the blind, an unobstructed view can be obtained. Much time will now be saved if the photographer can have a companion who will go to the blind with him and leave as soon as everything is ready. Unless the bird sees or hears some one leave the blind it will usually remain suspicious for a long time, but, as they cannot count, one person leaving is as good as two and the bird soon returns. After the bird has once decided that all is well, the photographer can make considerable noise and movement within the blind without frightening it. Any number of exposures can be made—plate holders changed—notes written—all within a few feet of the unconcerned birds. If there are eggs in the nest, one will see how carefully they are adjusted, how the feathers of the breast are lifted and parted so that the eggs will come in contact with the "brood spots"; he will see the parent bird preen its feathers—arrange the nest materials or perhaps pull down leaves to better conceal itself. Occasionally the mate will come bringing food, or they will exchange places, often with a delightful little ceremony. If there are young, the old birds can be watched bringing food, cleaning the nest and so forth. One will be close enough to identify most of the food brought to the young and observations can be made on the economic value of the birds. Best of all, everything can be accurately recorded by the camera and one's observations communicated to others far more graphically than by pen or by word of mouth.

THE UMBRELLA BLIND

A good method of studying and photographing birds is by means of the "umbrella blind," which is here seen set up in a daisy field near the nest of a bobolink.

The possibilities for the use of the camera and the blind are almost unlimited. Every bird presents a different reaction, a new problem to be solved, and while the general principles which have been laid down will hold for all birds, scarcely two birds will respond in the same way, so that one's ingenuity will be continually taxed to the utmost. Some species are extremely stupid, others extremely intelligent; some are very wary, others very tame; some are most easily studied when incubating, others when brooding; and still others only after the young have left the nest. Even within a species no two birds are just alike and one may find dozens of nests where the birds never get tame enough to photograph and suddenly stumble onto one where the bird behaves like a domestic fowl. In no way is the individuality of the bird better brought out than by an attempt to photograph it and gain an insight into its intimate life.

But enough has been said to point out the initial steps which the naturalist photographer must take and although the road is beset with difficulties, it is so paved with fascination that, once upon it, it is difficult to leave until the height is reached and one looks back upon his efforts, his failures, and his achievements with the knowledge that what he has done is permanent and that the world is richer for it. What would we not give, to-day, for a photographic record of the hordes of passenger pigeons that once flocked across this country, for a picture of one of the herds of bisons that roamed the plains, for a glimpse of the home life of the Labrador duck, or the Carolina parroquet or any of our vanishing wild life that may soon be gone beyond recall! True, we have passenger pigeons in our museums and bisons in our parks, and pages by the score descriptive of their former abundance, and we have artists like Fuertes and Lodge and Thorburne and Brook who can almost make the birds live. True, likewise, the photograph has its limitations, but if we wish to hand down to posterity an exact representation of our wild birds to-day and a few square feet of their environment, no better means has yet been devised than that of the maltreated and much-maligned camera.

THE SLASH PINE

BY WILBUR R. MATTOON,
FOREST EXAMINER, U. S. FOREST SERVICE

THERE is a species of pine in the southeastern portion of the United States, little known, yet of notably rapid growth and very high commercial value. It is a better tree intrinsically than the well-known longleaf pine. Its growth is more rapid, its wood heavier, harder, and stronger, and its yield of turpentine larger and of a better grade. This tree is slash pine (*Pinus caribæa*). It is extensively cut and contributes, at a rough estimate, over a billion board feet annually to the yellow pine lumber output.

Slash pine is not well known, either generally to the public or silviculturally to the forester. The cause in each case is clearly apparent. The tree has been designated by at least four different botanical names. And in Forest Service literature it was formerly called "Cuban" pine but is now officially known by the name here used. The wood of slash pine closely resembles in its structure the heaviest grade of longleaf pine, and as such it is sold on the market without discrimination. The juvenile and young trees look much like loblolly pine, and the more mature trees equally resemble longleaf. Among persons of trained observation mistakes of identification of slash pine have not been infrequent, while on the part of almost all others, except observant turpentine or logging men, the species as a rule escapes recognition. Furthermore, this section of the country is the last east of the Mississippi River to be included in intensive silvicultural studies by those interested in the future management of the country's forests.

All indications are that slash pine possesses in the highest degree the essential silvicultural qualifications for profitable handling

GROWTH AROUND PONDS

A characteristic of slash pine is its occurrence as almost exclusively the only forest tree in a broad band around the margins of the countless "ponds" scattered over the coastal plain from South Carolina to Louisiana. On the opposite margin of this pond in South Carolina the slash pine trees may be seen in the right background. The measured yield was about 18,000 board feet of saw timber per acre.

TYPICAL LOGGING VIEW IN MATURE SLASH PINE FOREST

The trees are cut and sold on the market without distinction as longleaf pine. The wood of slash pine is the heaviest, hardest, and strongest coniferous wood grown in the United States. It averages a little heavier than hard maple, beech, and sweet birch and is about equal to burr oak, yellow birch, and white ash.

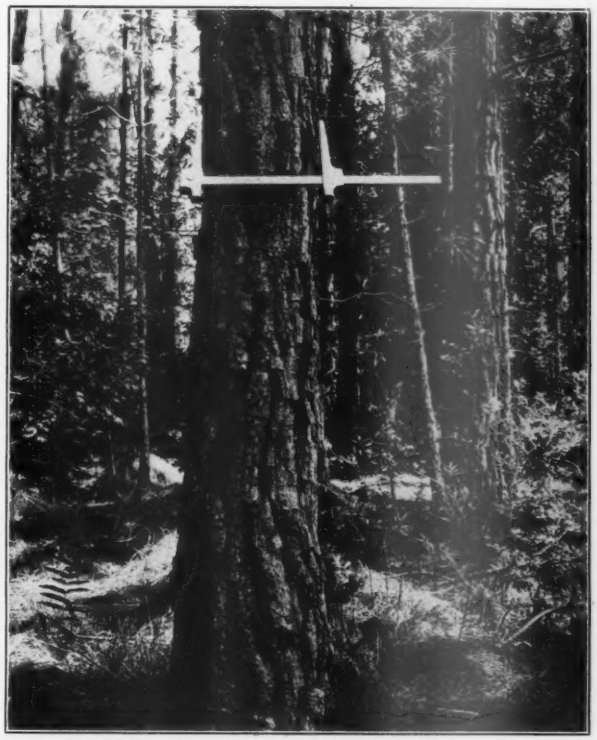
A FIFTEEN-YEAR GROWTH

The characteristic straight, clean trunk of slash pine is apparent in this 15-year-old pole stand. The trees average 42 feet high and about 6 inches in diameter breast high. The inherent high tolerance by which the tree is enabled to grow rapidly in close density—about 1900 trees per acre in this stand—is one of the chief factors for the wide-spread advance of slash pine over lands formerly occupied by longleaf pine.

under forest management. Thinnings, for example, are very profitable on account of the by-product of turpentine derived prior to cutting the trees for ties, cordwood, poles, pulpwood, or other products. Recent studies of the yield of crude turpentine from young slash pine indicate for periods of from 15 to 25 years net returns of from 9 to 11 per cent on the investment in land. A reliable lumber authority in northeastern Florida recently estimated that of the total second-growth pine cut for sap ties and other sap timbers in the region, although all is sold as "longleaf" stumpage, probably not less than 90 per cent, as a rough estimate, consists of slash pine.

Following the removal of the virgin longleaf pine, slash pine is spreading rapidly over large areas of flatlands and moderately hilly uplands of the South Atlantic and Gulf coastal plain. This is due to its prolific seed production, its very rapid growth, its ability to grow under partial shade and in dense stands, and its adaptability for growing on the poorest sandy soils and poorly-drained flatlands of the South. It adapts itself and grows rapidly on practically all soils except the very deep, dry, upland types, where the mammoth tap-rooted longleaf alone succeeds. The seeds and seedlings of slash pine are not touched as food by hogs, which is in striking contrast to the enormous destruction of longleaf by these animals. In three years it attains a height of from 3 to 5 feet; while at the same age longleaf is just emerging from the ground and beginning its real battle with fires, which burn practically every year in the South. With protection from hot fires for about the first two years, slash pine often succeeds in coming through with a sufficient number of saplings for a good stand.

The range of slash pine extends from Charleston, South Carolina, southward to the Keys of Florida and westward through Georgia, Alabama, Mississippi, and Louisiana to the Mississippi River. It has been found by the writer occurring on several hundred square miles in southwestern Lou-



AN AVERAGE SEVENTEEN-YEAR-OLD

This slash pine is 10.8 inches in diameter (breast high) by 61 feet tall. It is the average tree in a 17-year-old stand near Glen Saint Mary, Florida. In this time the stand has produced 12,600 board feet of saw timber per acre, scaling all trees 5 inches and over in diameter by mill scale. The thick mat of pine needles ("straw") is evidence of the fire protection which has been continuous during the life of the stand.

CHECKING WIND-BLOWN SAND

On Santa Rose Island, on the coast of western Florida and one of Uncle Sam's Military Reservations, slash pine succeeds in spite of the tropical hurricanes and continually shifting sands. The view shows the effect of the trees in checking the movement of wind-blown sand.

AND FOR BEAUTY ALSO

Dr. Charles A. Sargent expressed the opinion that slash pine is "by far the most handsome of all southern pines." This sentiment appears to be borne out by the very pleasing bit of landscape shown here by a bungalow in the town of Slidell, Louisiana.

isiana, many miles west of the westernmost limits of distribution given by any botanical authorities of that region. Its range covers roughly about 35 per cent of the geographical range of longleaf, and extends beyond the latter over some 8 to 10 million acres on the Florida peninsula.

With some 20 to 30 million acres of land, mostly pine "barrens" and other poor, sandy lands, in excess of the maximum amount that will probably be utilized for all

HIGH MONEY RETURNS IN EARLY LIFE FROM TURPENTINE

In this 13-year-old slash pine stand, 104 trees per acre are being worked for turpentine. The remaining 524 per acre are yet too small. Unfortunately, the wasteful boxing system, instead of the cupping method, is being used. If cupped and properly handled, well-stocked stands like this will yield naval stores for a period of from 25 to 40 years. At 10 cents per box, the present local price, this stand is bringing its owner $10.40 per acre for a by-product which does not necessarily appreciably lessen the value of the standing tree. The stand here shown is growing on flat, poor, sandy "pine barrens" in northern Florida, at present valueless for any other commercial purpose.

agricultural purposes during the next half century, it appears certain that slash pine will occupy an increasingly important place in that economic development which aims to put unused lands to their most profitable use. The future will undoubtedly see the pine forests of the South handled as second-growth stands of various ages, generally not exceeding 50 years. The species which will make up the future forest will, as a rule, be those producing in a given period the largest quantity of wood, combined with desirable intrinsic qualities of clearness, grain, and mechanical properties.

STATE FORESTS' VALUATION

PENNSYLVANIA'S million acres of forest land, which cost the state $2,275,000, are now valued at over $6,000,000, says Commissioner of Forestry, Robert S. Conklin. This increase is due to rising timber values, permanent improvement made by the Department of Forestry, and to tardy recognition of the fact that little trees grow into big trees and have an actual money value which is steadily increasing. Surely money put into an established business of this kind is an investment and not an expenditure.

ONE OF THE UNDREAMT-OF THINGS

By Lewis E. Theiss

WHILE pruning a plum tree last spring I found two cocoons which I secured and placed in an open box inside of our screened dining porch. In due season two moths emerged—females of the species *Callosamia promethea*. Though not particularly brilliant in their markings, they were nevertheless very beautiful. Their wings were perhaps three to four inches in spread. Shortly they crawled from the box and up the screening, where they remained.

That evening half a dozen moths of the same kind were fluttering eagerly outside the screening. In the *Girl of the Limberlost* Mrs. Porter tells how a moth in the swamp exuded a yellow fluid on the shoulder on the Girl's mother, where it clung, and thus attracted other moths. We watched to see what would happen here. One of the moths did exude a few drops of a yellow fluid which hung in shining drops in the meshes of the wire. Our interest was now keen and we kept close watch.

That evening fully twenty-five moths, both male and female, of the same kind, came fluttering at dusk to our porch, and all night those without tried to reach the two imprisoned moths within. On the following day several of the moths remained during the entire period of daylight, and at dusk at least forty moths were fluttering about the screens. There were so many it was impossible to count them accurately.

To us, who had never even seen a moth of this kind before, it was a great treat. It convinced us of the truth of Hamlet's observation to Horatio: "There are more things in heaven and earth, Horatio, than are dreamt of in thy philosophy." For we had never dreamt of such a sight as those beautiful moths afforded as they fluttered without our screens.

Now we are going to do what we should have done long ago—learn about some of the undreamt-of things; and already we have a box full of various cocoons and chrysalids, and the spring pruning will yield more. Truly we mortals are a blind race.

MICHIGAN IN THE PINE BLISTER FIGHT

THE Michigan Committee for the Suppression of the White Pine Blister, composed of Professor L. R. Taft, state inspector of orchards and nurseries; Dr. Filbert Roth, Director of the Forestry Department of the University of Michigan, and A. C. Carton, of the Public Domain Commission, have prepared an amendment to the Michigan forestry laws, providing reimbursement for the owners of pine trees, gooseberry and currant bushes which may have to be destroyed should the blister invade Michigan. The Commission provides to stamp out the disease the moment it makes its appearance.

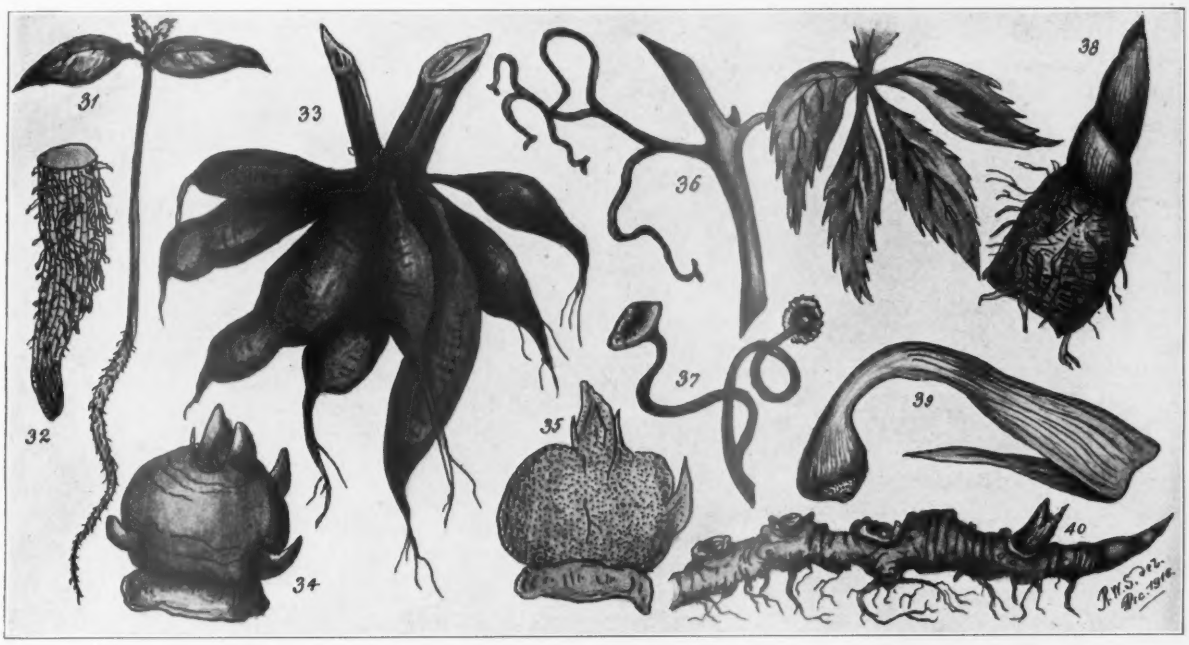
PRAIRIE dogs have practically been destroyed over 767,000 acres of National Forest range in New Mexico and Arizona within the last five years by the Biological Survey. During this period, a total of about 2,500,000 acres of Government land in the West has been relieved of range-destroying rodents.

EARLY SPRING AND SUMMER FLOWERS

BY DR. R. W. SHUFELDT, C. M. Z. S.,
EDITOR OF THE DEPARTMENT OF WILD FLOWERS

OF all the different methods of studying wild flowers, there is none better than to transplant them from where they flourish in nature to the home, and there watch their daily growth and development at our leisure. Of course this applies, as a rule, not only to those that will bear transplanting and not be injured by it, but to those which are of a convenient size for experimentation of this kind. There are hundreds of plants in any region, in any part of this country, which it will repay the student of flowers to observe during the various growth-variations that take place in them, from the initial stages of their seed-germination, to include the several stages of decline and death. Any medium-sized room, properly heated and lighted, will answer as a laboratory for such experiments and observations. There should be flower-boxes of suitable sizes, filled with various kinds of soils and sand, placed on tables where the sunlight may reach them, in order to maintain, as nearly as possible, the conditions which the species selected for observation enjoy in their normal ranges in nature. During some experiments, too, some of the boxes may be kept in the shade, and still others in utter darkness.

A first-class microscope with its complete equipment, as well as a good hand-lens, are the chief instruments required in work of this class. When some of your plants begin to flower, they should be by an open window, in that you may observe as many as possible of the various species of insects that visit them, and the part they play



ILLUSTRATED GLOSSARY—ROOTS, TENDRILS, AND OTHER STRUCTURES

Figure 31 illustrates the root-hairs on the primitive root of the seedling maple, and Figure 32 is the extreme tip of the same root, magnified many times. The absorbing surface of roots is enormously increased by the presence of these root-hairs. It is surprising how rapidly they can supply all parts of the growing plant above ground with moisture. A large number of annual plants, such as corn for example, possess roots of this character; they are called fibrous roots, as they have the structure of certain kinds of tuberous fibers. The various forms of fleshy roots and their functions have already been defined and described in the "Glossary" for last month.

Good examples of tuberous roots are seen in such plants as the common sweet potato and the dahlia (Figure 33). Such growths possess no main root, while the nourishment for the growing plant is stored in these tubers. The common peony is another good example of them. Common Irish potatoes are but tuberous parts of stems, and not really roots at all.

The nature of secondary roots is touched upon in the article in this issue, while in addition to these we have another class of roots known as aerial roots. Tropical forests supply the best examples of these, or in countries where the climate is particularly damp and warm. Good examples may be seen in sugar cane, and in various representatives of the fig tree family. Such roots are given off from the stem of the plant or tree above the ground, finally growing down into it, and then behaving just like ordinary roots. Throughout this country where plants or vines are found, we see splendid examples of aerial roots in the common poison ivy, in the trumpet vine, the fox grape, and the Virginia creeper (Figures 36 and 37). Aerial rootlets of the class here alluded to are principally applied to climbing, rarely having anything to do with the nourishment of the vine or plant possessing them. In most cases they take the place of tendrils, as just pointed out in the Virginia creeper; they cling by their suckers (Figure 37) to trees, walls and buildings, and never develop buds, leaves, or thorns. Underground or subterranean stems and branches must not be confounded with roots. In the first place, there is the ordinary rootstock or rhizoma; secondly, the tuber; third, the corm, and lastly, the bulb. A rootstock is a creeping branch or stem found below or partly below the surface of the ground. Two kinds of rootstocks are shown in the illustrated glossary above. In Figure 38 the short rhizoma or rootstock of a trillium, from which the bud is protruding above; in Figure 40, the rootstock of Solomon's seal. Note at its right-hand end the *bud* for the next year's growth, while on top, just to the left, the basal end of the old stalk of the present season is found.

A tuber is nothing more than the thickened part of a rootstock, and a very familiar example of it is seen in the common potato. The solid bulb or corm has excellent examples in the ordinary garden crocus, or in the Jack-in-the-pulpit. In Figures 34 and 35, the bulb or corm of the crocus is presented; in Figure 34 it is just beginning to sprout, while in Figure 35 there is a section of one of these bulbs, made vertically through its center. Small bulbs, attached to bulbs above ground, such as we see in the onion and common garden lily, are called bulblets. They are nothing more than dwarfed bulbs with thickened scales, and their usual fate is to become detached, to fall to the ground, and to grow as independent plants. In Figure 39 is the leaf of a common lily; its lower end, or the underground portion, is thickened into a "bulb-scale"; the dotted portion shows how thick it is. In the autumn the lily leaf dies down to this thickened base, which later remains a scale of the bulb. This goes on season after season, the bulb developing from the center, to produce the leaves and flowers of any particular year, the external scales surrendering their nourishment for the purpose, a purpose duly followed by their death and decay.

in the matter of fertilization and cross-fertilization. An accurate diary should be kept of all such observations, especially the names of the species and the dates. In certain small receptacles different kinds of seeds may be planted, and their modes of germination carefully studied and recorded. Indeed, there are hundreds of experiments

A WELL-KNOWN HARBINGER OF SPRING

FIG. 1.—Rue Anemone (*Anemonella thalictroides*) is one of the earliest flowers to bloom in the spring, and it belongs to the Crowfoot family (*Ranunculaceæ*), in which group we also find such well-known plants as Clematis, Buttercups, Meadow Rue, Marsh Marigold, Columbine, and others. Rue Anemone has no petals, while there are four or five, often as many as ten, white, or sometimes pinkish, oval sepals. The roots are tuberous and small, and from them arises the wiry, slender, black stem. Leaves compound, 2 – 3 – ternately, the leaflets being roundish, moderately three-lobed at the extremity, and heart-shaped (cordate). Flowers arranged in a sort of cluster, the flower-stem seemingly all springing from the same point on the upper end of the main stem. This common little flower occurs in the woods from southern New Hampshire, westward to Minnesota, southward to Kansas, and northwest to Florida.

to be made upon no end of plants in the region in which the observer has his or her home; and if systematically and intelligently conducted, no one may say in advance what important results some of the experiments may lead to in time. In this work do not forget the aquatic plants, but be sure to make provision for studying them through supplying the proper receptacles in which to grow them. As a matter of fact, many other lines of research and investigation will occur to you as the work goes merrily on.

You should visit the woods, fields, and other parts of the country just so soon as the first breath of the coming spring is felt. Go well equipped for collecting, and be sure you do not forget your botanical tin-can that comes for that very purpose. If the season opens up unusually warm, some of the very earliest flowers may make their appearance during the first week in April in the Middle Atlantic States. The best localities for these are bright, sunny places, in woods where the soil is rich, and the trees old and standing well apart, and you will not have gone very far before you discover that the anemones have started to come up; if you chance to be in a region where they are more or less abundant, you will come upon them almost at once. They are very prone to appear near the roots of some large tree or other. The specimens shown in Figure 1 were growing within a foot of a big tulip tree, where they had sprung up amidst the dead leaves and other débris of the vegetation of the previous year.

This Rue Anemone possesses curious-looking, tuberous little roots, grouped in a small bunch; and if you aim to take the plant home for study, dig up the entire speci-

THE ROSY KING OF THE MARSHES

FIG. 2.—The Swamp Rose Mallow (*Hibiscus moscheutos*), one of the most conspicuous marsh flowers of the summer months, and one of the most beautiful. It belongs to the rather small Mallow family (*Malvaceæ*), which contains several genera of Mallows. It is a tall perennial that grows from a yard to seven feet in height. Its late summer seed-pods are shown in Figure 3. The toothed leaves are ovate and pointed, and the stem may be finely hairy above. Often the upper leaves are three-lobed, and inclined to be downy both above and below. The form of the rose pink petals of the flower is well shown here, as well as the shape of the two seed-capsules below it. As to locality and range, Gray states: "River-banks and fresh or brackish marshes near the coast, east Massachusetts and southward; also lake-shores and swamps (especially near salt springs) westward to Ontario and Missouri. July—September."

men, roots and all, packing it properly so it can be carried without injury—otherwise the delicate thing will wilt within the next half-hour. Very frequently you will find the Wood Anemone or Wind Flower (*Anemone quinquefolia*) growing close to the rue anemone; but the two are easily distinguished, as the former bears only a single flower, while the latter bears two, three, or maybe four

in a cluster, as shown in Figure 1. Generally, however, there are but three blossoms to the plant, the middle one opening first, and the remaining two following later. Thus the time of blooming is prolonged, and opportunity is given certain insects to perform the work of cross-fertilization, this service being usually accomplished by various species of early bees and bee-like flies. The leaves of the rue anemone are dark olive green, and in some respects are said to resemble those of the Meadow Rue in form and color.

As spring passes into summer in the Mid-Atlantic States, a great many flowers, representing a great number

THE PERPETUATORS OF THEIR KIND

FIG. 3.—Along in the early autumn, in the Middle Atlantic States where the Rose Mallows grow, we find their tall, dark-brown stems, bearing a few equally dark-brown and withered leaves. Above these are the blackish-brown and opened seed-pods, arranged as shown in this illustration. The pods represent the fruit of the Rose Mallow, and they are usually 5-celled, with a great number of smallish dark-colored seeds in each cell. These are easily jarred out by shaking the long, dry stems.

of families and a still greater number of genera and species, begin to blossom. The display is almost bewildering to the collector, and still more so to the out-of-door photographer of flowers. However, from this bewitching array of form and color, set in every imaginable shade of green, tan and brown, we must select some subject for description, or else the lovely days of spring and summer will slip by, leaving us almost where we stood when the anemones began to peep above ground. As we follow the path through some shady wood, keeping ever near the brooklet whose crystal waters tumble along in the same direction, we may note, on every hand, the coming of the elegant early ferns; the patches of brilliant May Apples;

ONE OF THE RARITIES OF THE SHADY WOODS

FIG. 4.—A beautiful specimen of the Showy Orchis (*Orchis spectabilis*). This by no means abundant plant ranges from New Brunswick and New England southward to Georgia, westward to Missouri and Dakota. Most botanists place the 18 or 20 genera composing the Orchis family between the Arrow-root family (*Marantaceæ*) and the Willow family (*Salicaceæ*). It is not difficult, however, to recognize the Showy Orchis, especially with such a picture of it as is here presented. Note its *two* oblong-obovate, shiny leaves; its floral bracts, which are leaf-like and lanceolate in form; they generally exceed the flowers in number. Each flower has an undivided ovate lip, which, while usually *white*, may be, in some specimens, of a magenta pink. In the center of its range this Orchis is found in flower during the months of May and June.

many grasses and sedges, and scores of other plants which will flower as summer advances. The soft, balmy breezes of early June easily cause the tender leaves of trees and shrubs to tremble, as they come and go in gentle waves, having hardly the force to create so much as a quiver among the plants, now so luxuriantly appearing about their roots.

One very beautiful and very sturdy little plant in particular is quite oblivious to the nodding and bobbing of its breeze-shaken neighbors. This is the early Showy Orchis (*Orchis spectabilis*), and the flora of the region has no representative possessing a more interesting life-history, greater beauty, or more attractive form (Fig. 4). Its pair of large, glossy green leaves are broadly elliptical in outline and quite silvery upon their under sides. Note in Figure 4 how they develop just so soon as they push their way up through the débris of last year's vegetation. Your hand-lens will help not a little here; only you must imagine the flowers to be a bright pink—sometimes a purplish pink—with their lowermost petals white. The fertilization of these little plants is most interesting; for some female bees of certain species seem almost to be built along lines to effect the operation successfully, and this is later carried on by some species of butterflies.

Figures 2 and 3 are reproductions of photographs of the flower and seed-pods of the gorgeous representative

of the Mallow family (*Malvaceæ*), it being the Swamp Rose Mallow (*Hibiscus moscheutos*). This great, rosy-hued beauty may be seen far off, be it growing among the tall, rank grasses of the salt marshes, or among the cat-tails, alder bushes, or forty other species along the edges of pools and ponds, or overgrown swamps, for the matter of that. It is probably the most striking flower of the entire flora of this country, and it reminds one very much of the common hollyhock of the gardens. Several true relatives of it, however, are to be found in the genus *Hibiscus*, as the Shrubby Althæa of our gardens (*Hibiscus syriacus*), which was introduced from Asia; the Flower-of-an-hour (*H. trionum*) from Europe, and a number of others, which it would require too much space to describe here. Descriptions of them are to be found in all of our standard botanies. Mathews tells us that "The most frequent visitors of the genus *Hibiscus* are the honeybees and bumblebees." Mrs. Dana gives us the following graceful paragraph on this species: "When the beautiful rose mallow slowly unfolds her pink banner-like petals, and admits the eager bee to her stores of golden pollen, then we feel that the summer is far advanced. As truly as the wood anemone and the bloodroot seem filled with the essence of spring and the promise of the opening year, so does this stately flower glow with the maturity and fulfilment of late summer. Here is none of the timorousness of the early blossoms, which peep shyly out, as if ready to beat a hasty retreat should a late frost overtake them, but rather a calm assurance that the time is ripe, and that the salt marshes and brackish ponds are only awaiting their rosy lining."

A MUCH-DESPISED WEED MAY BE A MOST INTERESTING PLANT

FIG. 5.—Upper parts of the longitudinally grooved stems or scapes of the Common Plantain (*Plantago major*), bearing the densely-flowered spikes of this very cosmopolitan and common plant, which occurs everywhere along the roadsides and only too frequently crops up in great numbers on our lawns and pastures.

ONE OF FLORIDA'S BEAUTIFUL FLOWERS

FIG. 6.—The Catharine Flower (*Thysanella fimbriata*) flourishes in the sandy regions of certain parts of Georgia and Florida. It belongs in the Buckwheat family (*Polygonaceæ*), and there is but one other species, the *T. robusta*, which flowers all the year around in the pine lands of Florida, while the above species flowers only up to about the first of January, lasting all summer. The flowers are a most delicate *pink*, with some pink and white and a few pure white. The leaves are very narrow and pubescent. It grows in bushy fashion about a yard in height, the root being small, tough, and for the most part slender.

It will not be necessary to give any further account of the lovely flower here shown in Figure 6, beyond what occurs in the legend beneath it.

In regard to sending flowers to the editor of this Department of AMERICAN FORESTRY for description, they should come in excellent condition if packed as soon after

gathering as possible, and mailed by parcel post direct to No. 3356 Eighteenth Street, N. W., Washington, D. C. Stiff cardboard boxes, or better still, cigar boxes, are the best receptacles in which to send them. They can be placed in several layers of well-dampened newspapers. Collect only the best and most perfect specimens, and send the entire plant if possible—flowers, stems, leaves, seed or fruit, roots, and all. Do not break the stems or roots, but curl them carefully so the specimen can be photographed, as was the Catharine Flower shown in Figure 6, recently received from Mr. R. H. Young, of Haines City, Florida.

Mr. Young, having read what was said about *Smilax vines* in the last November issue of AMERICAN FORESTRY, also kindly sent me fine specimens from his state of the Laurel-leaved Smilax (*Smilax laurifolia*). This particular "Green-briar" forms an exception to the rule, in that it remains "evergreen" throughout the season. Its berries are black, and its leaves vary considerably. We also have the Lance-leaved Smilax (*Smilax lanceolata*), specimens of which I have recently received from South Carolina; in this the leaves vary but little. We have in this country a good many other species of Green Brier, or Cat Brier as they are sometimes called, of the genus *Smilax*.

In Figure 5 we have a very excellent example of the beauty there really is in one of our most abundant and most heartily hated weeds. Every country lad in the United States, in the region where it grows, knows it well, and so does many a city lad, too. How many boys have been directed by their parents to rid the front grass-plot of this weed by the aid of a table knife it would be hard to say. But when we come to examine the plant, especially if we use a high-power microscope, our surprise is very great when we discover what a really beautiful flower this Common Plantain or Ribwort (*Plantago major*) has. It is of cosmopolitan distribution, and has many species related to it in its own genus of the Plantain family (*Plantaginaceæ*); the very rare *Litorella uniflora* belongs in the same group.

FOREST ROAD UNDER FEDERAL AID ACT

THE Secretary of Agriculture has authorized the location survey of a section of the first project in road construction submitted under the "National Forest section" of the Federal Aid Road Act. This section is the only one in the law which provides for actual construction of roads by the Federal Government. Roads built under authority of this part of the law are designed primarily to promote economic development and to serve public convenience in localities where much of the land is in National Forests. The proposed road on which action is taken is in the Apache National Forest, Greenlee County, Arizona. The preliminary estimate of the cost of construction of the 71 miles of road to be surveyed is $342,500. Greenlee County proposes to hold a bond election to raise the necessary funds to contribute fifty per cent of this amount. An additional 29 miles of road in Apache County will be necessary to complete the project, and, according to the preliminary estimate, will bring the total cost to $420,000.

Approval of the plans for the survey was based upon the industrial resources which will be opened up and also upon the offer of one-half coöperation by the county.

Several other projects for which coöperation has been offered are pending for roads in California, Montana, and Idaho. Where two projects have equal claim for consideration, the decision will, it is stated, be made in favor of the one for which the best offer of coöperation is made.

BOY SCOUTS BATTLE MOTHS

FOR the first time in the history of the organization a state has called upon the Boy Scouts for help to battle a plague.

The state is Ohio and the plague is the Tussock Moth, a pest that was destroying the trees of Canton, President McKinley's home town. In a two weeks' campaign the Scouts collected 3,000,000 of the eggs and as a result Troop No. 3, headed by E. R. Hoover, scout master, was awarded a large parade banner for collecting the greatest number of eggs. James Emsley made the best record for an individual scout.

The banner was awarded by Mayor Stolberg, who commended the work not only in this campaign but of the Scouts as an organization. So great was the interest in the campaign that was waged day and night for the two weeks that Prof. A. S. Barnes, of the Department of Entomology of Harvard, requested a quart of the eggs be sent to him for investigative purposes.

"The Scouts have not stopped the work, however," writes Scout Master Hoover, "but they are keeping right on with the campaign. This precedent of working under direction of state officials may be a help to other cities in looking after the trees and plants. It simply shows that the Scouts are on call and willing to help any municipality in any worthy cause."

The American Forestry Association at its annual meeting passed a resolution endorsing the Boy Scouts' work and urged them to get into the fight against the spread of the white pine blister disease.

MAPLES

By Richard Butler Glaenzer

There is beauty in tropical samans,
Beauty and bountiful shade,
And the pride-of-India's plumes are fair
And cool till tempest-frayed;
There is splendor in poincianas
When flaming with birdlike flowers,
And mangoes invite when rich with fruit
Or blossomed to golden bowers;
Yet give me our northern maples
So sweet with sap in spring,
Even before their gay green gowns
Tempt robin and thrush to sing:
And give me their heart-leaved branches
As shields from the searching sun,
And their mourning dress of rainbow hue
When summer's course is run!

FORESTRY FOR BOYS AND GIRLS

BY BRISTOW ADAMS

THE WIND AND THE TREES

FRIENDS in so many needs, as the sturdy trees are to man, it is hard to tell in just what ways they best serve him. After they are cut for use they may shelter him against the storm and may warm and cheer him before the open fire-place. But as standing trees—in the forest, in the fields, along the fence rows, and by the roadside—they are the best friends in all plant life. They are comrades, too; helpful comrades, each with as true a self as a human friend, and each worth knowing in all ways that we can know them. It is quite as true with trees as it is with folks, that the better we know them the better we like them.

One meets a person who causes a dislike from the first; if one takes pains to try to overcome that dislike and to learn to know what good points there may be, the chances are that the dislike may turn to a kindlier feeling, or at least that it will grow less. Or one meets a person to whom one is drawn from the very first by the ties of a strong love; ten chances to one, the more one sees and knows of the good in that person, the stronger will the ties become. Try this, with either trees or folks, and see if it does not work out!

MICHAUX, the great French botanist, among the earliest to describe our American forests, made the great mistake, it seems to me, of setting down in cold black-and-white that our common scrub pine, or Virginia pine, was to him the most uninteresting tree that ever grew. I've always felt a bit sorry for poor little scrub pine ever since I read the sentence that Michaux passed upon it. For my part, I have ever had a tender spot in my heart for the sturdy and cheerful ways of this tree, its ability to thrive on poor land, its rapid growth, its power to bear seed and start new little trees at a very early age, its firm grip on gullied hillsides to hold them from the washing rains. But most of all I like the staunch way it stands against the March winds, and shunts the gales a-roaring upwards, away from the many little negro cabins, and even from the larger homes in Maryland, Virginia, and southward.

We have reason to know about this tree, because the first house that we built, the home in which the two little boys were born, was in a clearing of these scrub pines. The trees that we cut away to make room for the house in the early spring helped to warm us on our hearth-altar during the following winter; and the belt of pines left to the northwest were a great defence against the cold winter winds, and the boisterous gusts of March. How much fuel they saved it would be hard to say; but we know well what a lull seemed to come in the storms when we gained the leeward of our little grove of scrubs. When the snowflakes swirled dizzily over the open fields, they dropped gently down behind our screen of pines and blanketed the garden against the bitter freezes of the exposed hillsides.

THUS, when March comes, I am likely to think of trees and the wind, and of the effects they have upon one another. March winds are very hard on the trees. March never has had a very good name among the months. The name by which we know it comes from Mars, the war god, whose reign all of us would like to see ended on earth forever. It cannot be denied that March is a wild and rough time o' year. The old Saxon name was Rede-monath, or rough month; it was also called Hlyd-monath, or loud month, because it was so boisterous. When the French Revolution set out to reform everything, even the calendar, it was Ventose, or windy month.

This is the time, then, when the trees perform their great service of shelter from snow and wind. In the still heat of simmering summer they make pleasant shade for the cows in the parched meadows, and their heavy crowns of leaves let scarcely a ray of sunshine through. In the winter, the little bare branchlets break the wind up into small eddies, and the trunks and branches, pointing upwards, direct the wind in the way it should go above the tiny home of man, nestling in the shelter of some age-old sycamore, or maple, or oak, or behind a belt of evergreens like our brave array of scrub pines.

IN whatever part of the country you may be, there is no finer sight than that of the farm houses, barns and outbuildings, behind their guardian trees. Some have been planted by the loving hands that built the first homes many years ago; others have been left standing for the shelter they would afford when the forest was first cleared away to make room for the farm.

In the New England states there will be graceful elms or spire-like spruces; in New York the sugar maple is not uncommon; farther south there will be hickories, then pecans, magnolias, great moss-bearded live oaks. There is not half so fine a sight anywhere as I have seen near the Carolina coasts where the crepe myrtle, a beautiful silver-barked tree, overshadows the dooryards, a protection from the damp and chilling winds of March, to be later covered with filmy blossoms of glowing pink. Where the color of leaf and bloom combines with the swaying grey Spanish moss on the same trees it is hard to imagine any growing thing more beautiful. For those of us north of Dixie's line, the crepe myrtle is known mainly as a shrub, and a rather tender one at that.

ON FLORIDIAN coasts the worst winds are sweeping hurricanes that level almost everything before them. There the cocoanut palms along the tide line of the Keys are likely to bend their heads toward the heaviest sea winds, so that their long fronds of leaves will not be stripped like umbrellas turned inside out by a wind that gets under. Here, too, the planters have set out the Australian beef-wood tree,—the Casuarina,—which grows faster, even, than the eucalyptus from that great island of great wonders. The Casuarina trees bend over like whips so that the sixty-mile wind slides up along their slanting branches and is thus warded off of the precious orchards and crops that otherwise would be beaten down and destroyed.

On the Pacific coast, shaggy sentinels of eucalyptus protect the fruit ranches of California from the winds that sweep over the widest stretch of water in the world, and they also help to protect from the drying winds that sometimes set toward the coast from the interior deserts. In Washington and Oregon soldier-like ranks of Lombardy poplars stand to the defence of apple orchards; in the states of the great plains wind-breaks of hardy trees that can stand long periods of drought keep the winds from drying out the crops planted in their shelter.

WHERE there are such wind-breaks, or shelter-belts, it takes less corn to keep the cattle warm through the winter; it takes less fuel in the house. The chores are done easier; and trees are a sure agent in tempering the wind to the shorn lamb. Think what a host of tiny creatures would be lost each winter if it were not for their protection!

Therefore, when March winds blow, my sense of gratitude to the trees is at its strongest. With their help I can keep the coal bill down while winter is lingering in the lap of spring. I have to admit that they shut off the view of the lake from my study windows; but, on the other hand, that lake stretches out straight toward the North Pole for about fifty miles, and beyond it there is no great height of land to Lake Ontario. Beyond that not a mountain range intervenes between us and Hudson Bay. That is a clear sweep for old Boreas, and he makes the most of it. We feel that we can scarce make headway against him; we open our mouths to shout a defiance above the storm and he blows our breath down our throats. Then we come into the shelter of some great tree or of a group of trees; we can stop and gather ourselves together and take a real breath, and gain new courage to face the storm once more.

$300,000 FOR PINE BLISTER DISEASE, AN EFFECTIVE QUARANTINE LAW

CONGRESS passed on Sunday, March 4, just before adjournment, two amendments to the Agricultural appropriation bill which are of vital interest to members of the American Forestry Association and to all interested in forestry and lovers of trees.

The first amendment added $300,000 to the appropriation for the investigation and eradication of the pine blister disease.

The second gave the Federal Horticultural Board much needed authority to declare effective quarantines in the case of the pine blister disease and other tree and plant diseases.

It is these two measures for which the American Forestry Association and coöperating organizations have been striving since last fall when it became apparent that vigorous measures must be taken to save the five-leaved pines of the United States and Canada which are threatened with destruction by the disease.

If this appropriation and this revised quarantine law are now supplemented by the legislatures of the states in the five-leaved pine belt passing appropriations and adopting stringent quarantine laws to enable their state authorities to deal properly with this menacing disease, there is hope that it will be prevented from spreading and perhaps be stamped out. The various states already infected and others where the disease may appear are now considering legislation to deal with the situation.

One-half of the $300,000 appropriation will be used by the Department of Agriculture in state coöperation, providing the states do their part in providing appropriations.

The original provision in the Agricultural bill was as follows:

> "For the investigation of diseases of forest and ornamental trees and shrubs, including a study of the nature and habits of the parasitic fungi causing the chestnut-tree bark disease, the white-pine blister rust, and other epidemic tree diseases, for the purpose of discovering new methods of control and applying methods of eradication or control already discovered, $85,915."

The amendment added the following paragraph:

> "For applying such methods of eradication or control of the white-pine blister rust as in the judgment of the Secretary may be necessary, including the payment of such expenses and the employment of such persons and means in the city of Washington and elsewhere, in coöperation with such authorities of the states concerned, organizations, or individuals as he may deem necessary to accomplish such purposes, $300,000, of which $150,000 shall be immediately available, and in the discretion of the Secretary of Agriculture of the remaining $150,000 no expenditures shall be made until a sum or sums at least equal to such expenditures shall have been appropriated, subscribed, or contributed by state, county, or local authorities or by individuals or organizations for the accomplishment of such purpose: Provided, That no part of the money herein appropriated shall be used to pay the cost or value of trees or other property injured or destroyed."

The existing quarantine law permitted the Federal Horticultural Board to declare a quarantine only where a dangerous plant or insect infestation was known to exist. This was entirely inadequate. What was needed was a law giving the Board power to declare a quarantine where such a quarantine was necessary to prevent the spread of the infestation. The amended law gives the Board such power and it may now declare a quarantine which will be effective in preventing the spread of the disease, in any state or territory or any portion of them, and in any section of the country.

It is expected that one of the first acts of the Board will be to establish a dead line through the great plains states in order to prevent the pine blister disease spreading into the West.

A FEATHERED DOG IN THE MANGER

BY LEWIS E. THEISS

THE story of the dog in the manger was intended to be a take-off on humans, but the situation portrayed sometimes has its counterpart among the dumb animals. A commotion on the back porch of a Pennsylvania home led to the discovery that birds were trying to secure the dry and shriveled berries of some black alder branches that had been used for Christmas decorations and subsequently put temporarily on the porch. In order to see the birds well, these branches were at once fastened to a low limb of an elm tree that swung just outside a window.

Shortly the birds flew down to the berries and proved to be those beautiful creatures, the waxwings. Sixteen of them came to feed, singly or in groups, on the dried berries. Some of these berries, which had fallen to the ground, had been picked up by the householder and put on the window sill; and there the waxwings perched unafraid and ate, although the householder and his family stood on the other side of the glass pane watching them.

When the feast was at its height, an enormous fat robin flew down to the berries, and, darting this way and that, soon drove the waxwings away. But he did not eat the berries. In fact he showed no interest in them. When the waxwings returned, he drove them away again. Then he took his stand on a nearby tree to guard the berries. The waxwings collected in the same tree, and there they sat, eying the robin. He made no move until a waxwing tried to get a berry. Then he darted at the offender. It was a curious sight to see these birds sitting in the tree, motionless, and watching one another.

When it became perfectly evident that the robin's sole motive was to keep the other birds from food he did not want, the householder went out and threw a snowball at him. All the birds flew away. But the berries were an irresistible magnet and soon the waxwings were back. Immediately the robin dashed on the scene and drove them off. Then he perched on the tree and mounted guard.

COLLECTING TREE AND FLOWER SPECIMENS

BY DR. R. W. SHUFELDT

AN invaluable aid in studying our wild and garden flowers is a good microscope, as powerful and standard a one as your purse can buy. You will not proceed very far into the field of even popular botany and wild flower study, before you find that it will require a stronger eye than the one you have in your head ere you can accurately discern all there is to be seen in a flower. Some of the modern microscopes are superb instruments; not only are they great and accurate magnifiers of minute structures, but they admit of the use of special accessories, so that one can either draw or photograph the object under examination. There are many types of fine and inexpensive microscopes on the market, which are almost indispensable to begin with, while the high-powered ones can be commanded after the student is satisfied that the study will be with him as long, perhaps, as he lives.

INSTRUMENTS USED IN PRESERVATION OF PLANTS

Behind the microscope shown in this picture is to be seen one of the covers (Venus covers) used in the Bureau of Plant Industry, of the United States Department of Agriculture at Washington. The specimen is a Rose Marsh Mallow (*Hibiscus moscheutos*), and forms a part of the Economic Collection. Note how the pressed flower is always fastened very carefully with little gummed slips, in the manner shown, on the right-hand page. Note the "data label" in the lower right-hand corner, giving full information about the specimen. The instrument shown is the "Spencer Dissecting Microscope," and near it are the dissecting needles, extra objective, and spring forceps with *curved ends*. One of these microscopes may be purchased for $9.00. Directions will later be given for the use of this instrument, with further details on plant preservation.

The forming of a working, scientific herbarium is another step in the study of flowers and it is quite a task, and requires special knowledge along a variety of lines. In the first place, you must know how to collect scientifically: to select in the field, or in nature, to speak more broadly, the class of material worthy of your care, and measuring up to what the specimen demands in any case. Always select the most perfect specimens, from root to flower. Keep collecting until the entire life-history of the plant is completely illustrated. Show the normal as well as the abnormal, and all the necessary variations of all the structures of any plant you bring in. Take leaves, for example: of course the forms assumed by them are infinite, even for the same species. Still we may, by judicious selection, very well illustrate the limits in any direction with a very few examples. A good way to study such a point as this, is to select some big oak tree, standing so far in the open that there is no danger that its fallen leaves in the autumn have become mixed up with those from any other tree. You will be surprised at the number of forms the leaves seem to have; yet, when you have judiciously collected forty or fifty of them and arranged them in a row in your study, how few it requires to actually illustrate, not only the variation, but also the fact that the leaves belong to that particular species of oak, provided the tree you selected was not a hybrid.

You must collect your flowers, seeds, seed-pods, roots, buds, and all the rest, in the same scientific manner. Collecting-boxes for use in the field can be obtained at any first-class naturalists' supply establishment, anywhere from fifty cents to two dollars and a half. Get the best every time. There are also admirable contrivances for the pressing of flowers manufactured, with instructions for using them, such as Riker's Botanical Press; wire presses, and plant presses of various models; all are excellent as well as indispensable.

In pressing flowers one must use every bit of one's scientific and artistic sense, in order that the pressed specimen shall exhibit every point and character it possesses, and every point one desires to show. One should likewise be familiar with all that is known up to date with respect to preserving the color of flowers, leaves, and other plant-structures during their pressing and preparation for permanent preservation.

In the summer, after any of your specimens are pressed, you may consign them to temporary folders until your

winter work and studies come around. The larger magazines may be pressed into service for this purpose, while the chief thing to be attended to is to see well to it that your stack is kept in a dry place with a proper weight on it, and where no one will handle it but yourself. When the season's botanizing is over with, you can enter upon the most inspiring and delightful task of starting your permanent herbarium. Special papers come for this, and they are of two kinds: one for the leaves (white or cream), and one for the covers (tan or brown). They are both after the order of parchment paper—heavy, durable, untearable, and of heavy weight. They should be of folio size; each page devoted to a specimen, unless it be too small, when several may be artistically arranged on one page. In the lower left-hand corner there should appear, neatly printed, written, or typewritten, the following data: the scientific name of the specimen according to the most recent authorities; the most widely employed popular name in brackets; the place and date of collection; the name of the collector, with a few lines on the color of the flowers and leaves; sexual characters, and the normal form and color of parts that become much distorted and changed through the process of pressing.

These folios should, as they are being completed, or even when in actual use and being continually added to, be filed in a special cabinet, with the compartments arranged according to the system you are employing in your work as to orders, genera, and so on.

My hope is that the few paragraphs I have been able to give here on this subject will induce many a boy and girl in various parts of the country to start an herbarium of the trees, shrubs, and plants of the region in which they live. Later I will give other rules for the preservation and illustration of plant-life, such as methods of taking imprints of leaves for comparison, and so on.

There is still another powerful adjunct to the flower-student's equipment, which must not be overlooked in this preliminary chapter on the subject: the photographic camera. Flower photography is a very expensive and often very difficult pursuit. Many things enter into it requiring special skill, long training, and experience, before one can hope to be at all successful. Some of the main things to be considered are: the selection of a complete and scientific outfit for studio and field-photography of flowers; as complete a knowledge as possible of the flowers to be photographed, and the use of a camera and its accessories in the field under all conditions, such as time, place, and weather. Your artistic sense will come powerfully into play here, in the studio as well as in the field, and you will soon realize that the point of view from which a flower, a shrub, or a tree is taken makes all the difference in the world when the final result of the operation appears on paper, or is thrown upon the screen at a lecture. Much more may be said on this most important subject, so I will, from time to time, furnish brief, illustrated accounts in AMERICAN FORESTRY as to how all manner of specimens in the vegetable world should be photographed.

NATIONAL FORESTS GIVEN PERMANENCE

AS a result of land classification work, more than eight million acres were eliminated from the National Forests in the last fiscal year, and, in addition, over 1100 individual tracts within the Forests were made available for homestead entry, according to the annual report of Henry S. Graves, Chief of the Forest Service, which emphasizes the necessarily permanent character of the National Forests, and points out the importance of definitely determining the status of the land which the Forests contain.

"The National Forests," says Mr. Graves, "are gaining in stability through the land classification work. It is important for the general public to know what lands are to be retained permanently by the Government, and what lands will be available for agricultural settlement. The whole Forest enterprise is based on the assumption of permanence. All the work is conducted with a view to constructive development of the property and its constantly increasing usefulness.

"Every timber sale is made with a view to future consequences. The work of protection from fire is not only to prevent the destruction of standing timber but to save young growth and encourage the natural reproduction on lands which have been injured by previous abuse. Millions of trees are established each year which will not come to maturity for a very long time. A regulated system of grazing looks to the upbuilding of the Forest range, as well as to its present use; and the investment of public funds in extensive improvements is predicated on the permanence of the Government enterprise."

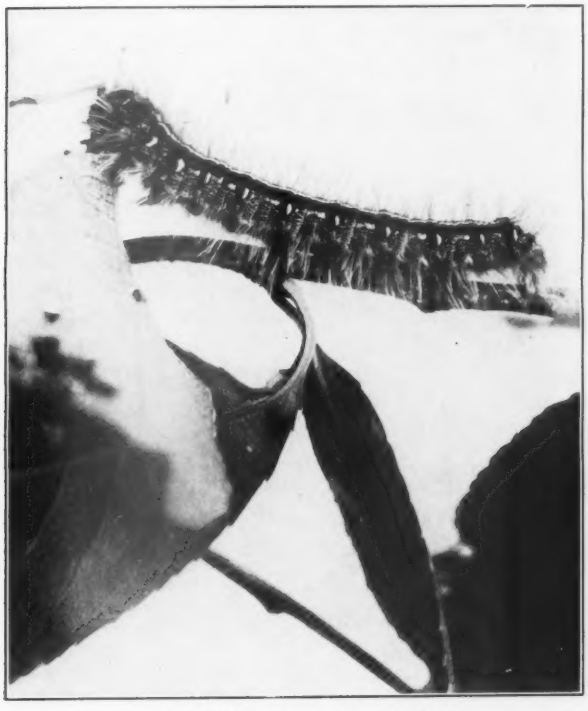
The need for consolidating land ownership where Government and private lands are interlocked is pointed out by Mr. Graves. Congress has, he states, already authorized an exchange of lands on the Florida, the Oregon, and the Whitman National Forests. Under the same policy exchanges have been or are being negotiated with South Dakota, Montana, Idaho, and Washington for school lands in the National Forests located in those states. The consummation of three of these exchanges now awaits final approval by Congress.

Other measures which will have a far-reaching significance in relation to the permanence of the National Forests, says the report, are the appropriation by Congress at its last session of ten million dollars for the construction of roads within the Forests and that of three million dollars to extend the National Forests in the eastern mountains by purchase. "The appropriation for the construction of roads will permit the opening up of regions heretofore inaccessible, will greatly increase the use of the resources in the Forests, will shorten lines of travel across the states and between communities, will stimulate prospecting and mining in mineral regions and will aid community upbuilding.

The importance of having public Forests at the headwaters of important streams has been recognized and greatly emphasized through the appropriation of $3,000,000 for continued purchases of land begun under the so-called Weeks Law.

THAT TENT IN THE TREE

DOUBTLESS a tree is as odd a place as one would choose to pitch a tent, but the birds are not the only ones that select trees for a summer home; the caterpillar uses them as a summer resort and from now on is the time to keep a sharp lookout for the pests. True, the caterpillar does not pick out the same localities every year, for he seems as particular as people when it comes to finding a new place to spend the summer. His appearance, however, is always an event; so much so in fact that the caterpillar's visits have been known as caterpillar years. The first of these recorded in this country was in 1646, when the historian of the Bay State Colony mentions the pests. Again in 1649 the new settlers suffered heavy losses from this fruit pest.



THE DESTRUCTIVE CATERPILLAR

Having an appetite that is seemingly never satisfied, the apple-tree tent caterpillars should be destroyed wherever he is found.

Wild cherry leaves are the favorite dish of the caterpillar and he also likes an apple or a plum leaf, although he does not confine his diet to these. The caterpillar will find his way, in the absence of his favorites, to the peach, pear, or rose and even to the beech, elm, and maple. He does this, too, at a time when the trees most need their foliage, and when he gets through, the tree is usually bare of leaves.

With the approach of spring an organized campaign can be inaugurated against the pest. Such organizations as the Boy Scouts could divide a town into sections and thus systematically examine every tree and fence corner. Recently the Boy Scouts of Canton, Ohio, campaigned against the Tussock Moth with such results that they were highly praised by Mayor Stolberg.

A. L. Quaintance, in charge of the insidious fruit insect investigations for the Department of Agriculture, tells, in an article on this subject, how school children can help in saving the fruit. According to a report sent in by Myron A. Cobb, of the Central State Normal School at Mt. Pleasant, Michigan, the tent caterpillar had decided to spend the summer in that locality. Circulars were issued to rural schools and a "tent caterpillar week" designated. The Elk Rapids Business Men's Association offered prizes for the greatest number of egg masses destroyed. The results were surprising.

NEST OF THE TENT CATERPILLAR

The nest of this destructive insect is found in neglected orchards and in trees along roadsides. If these nests are low they may be destroyed by hand, but if out of reach they may be destroyed by some form of torch on a pole.

Dr. M. R. Peck, of Cornwall, New York, organized the children of his neighborhood. The youngsters were instructed in destroying the "tents" and rewards were offered for the greatest number of egg clusters. The collection more than filled a bushel basket. What these places have done can be done anywhere if some person or the towns' newspapers take up the campaign and interest

the public by pointing out the tremendous loss from these pests every year.

As to methods of destroying the caterpillars Professor Quaintance suggests two. He says:

"Neglect to search out the egg masses during the winter will result in the appearance of the larvæ about the time the trees are putting forth foliage. The nests, at first small, are soon so increased in size as to attract attention. If the caterpillars are destroyed as soon as the small nests are detected, this will prevent further defoliation and the rule should be adopted to destroy them as soon as detected. In this work either of two methods may be employed, destruction by hand or with a torch.

"When convenient the nests may be torn out with a brush, with gloved hand, or otherwise, and the larvæ crushed on the ground, care being taken to destroy any caterpillars which may have remained on the tree.

"Use of a torch to burn out the nests will often be found convenient in the higher parts of the tree. An asbestos torch will be satisfactory, or one may be made by tying rags to a pole. Saturate either kind with kerosene. In using the torch great care is needed that no important injury be done the tree."

There are spraying methods, but these are not recommended in campaigns of this kind and should be only under the direct supervision of experts.

INDIA'S FOREST MANAGEMENT

A MEMBER of the Indian Forest Service, stationed at Mangalore, South Canara, South India, writes the following interesting letter:

The Editor, AMERICAN FORESTRY:

"I see your paper regularly and have a great admiration for it and for the vigorous fight being made in its pages for a sane Forest Policy by the state.

"I am not a United States citizen, nor do I know personally any member of the American Forestry Association, but if eligible I should like to join the Association.

"It is probably impossible for us in this country to realize the opposition which you are up against.

"Here the Government early secured complete control of practically all important forest tracts, and besides vast areas more or less wooded where conservation was deemed advisable. These great state properties, known as Reserved Forests, are administered by the Forest Service with something like a free hand, backed by the all-comprehending Forest Act.

"No important operations are carried on in the Reserved Forests except according to the provisions of carefully drawn up and duly sanctioned working plans, which prescribe, for a term of years, everything which shall be done in that forest. Prominent among such provisions are measures for improving the growing stock, which, with the soil, form the Capital on which fellings should represent only the naturally recurring Interest.

"It seems scarcely credible that Canada, for instance, should have yet to initiate her first working plan, and that the United States should be not much more advanced.

"Though it may be true, however, that our Indian Forests are steadily improving, while a large part of the timber stands of North America are deteriorating or even vanishing, yet I believe you would be astonished at the primitive methods of lumbering usually in vogue in India. There is little doubt that judicious expenditure on improved communications would enormously increase, say double or treble, the output without prejudice to situation or exceeding the possibility of the forests."

LOWEST FOREST FIRE LOSS

A LOSS to the Government of $162,385 in timber, forage and young growth was caused by fires on the National Forests in 1916, according to statistics compiled by the Forest Service. Although there was more than the average number of fires, the loss is the smallest that has been sustained from fires since the National Forests were established. A favorable season in the regions where the most severe damage is usually sustained is given as the chief reason for the relatively small loss.

A total of 299,377 acres of Government land burned over. In addition to this, the fires covered 123,160 acres of privately owned land in the National Forests where timber valued at $36,214 was consumed. About 44 per cent of the total area burned was located in the National Forests of Arkansas and Florida.

Of the 5655 fires which occurred, 4133, or 73 per cent, were confined to areas of less than 10 acres. Many of these small fires, according to the Forest Service, might have developed into serious conflagrations had they not been extinguished in their incipiency.

The average cost of fighting each fire was approximately half that of former years. Lightning was the chief cause of the fires and was responsible for 23 per cent of all those which occurred. The causes of 18 per cent were unknown, while careless campers started 17 per cent. There was a slight increase in the fires of incendiary origin, as well as those started by sparks from locomotives. With the exception of those caused by lightning, all the fires were due to human agencies. One fire in Idaho which burned 600,000 feet of timber was caused by the carelessness of a ten-year-old boy.

The season was one of particular severity in the southwest, as well as parts of Colorado and Wyoming, where local weather conditions created at times a grave situation. In Washington heavy loss was caused by fires which started in inaccessible places and which the rangers were unable to reach for several days because of the lack of trails.

TOWN forests are featured in the annual report of the Massachusetts Forestry Association just issued by Secretary H. A. Reynolds. It is announced that last year saw two more town forests started, those in Brookline and Walpole, and seven other towns are preparing to establish town forests during 1917. The association has offered to plant fifty acres to young trees in the town forest which makes the best showing among the first ten to be established in the state.

PLANTING SUGGESTIONS FOR APRIL

BY J. J. LEVISON, M.F.,
FORESTER TO THE CITY OF NEW YORK

APRIL is the month when almost everyone is interested in some form of planting. We may be contemplating the planting of large trees on the lawn or of very small trees in the woodland. Our interest may be centered in setting out shade trees, fruit trees, shrubbery beds, vines or flowers. Every one of these is a field in itself, full of detail and special application. Just how to plant and what to plant, in each case, are questions of special local bearing and can only be discussed on general principles. At this writing we will consider the more important of them as well as the most desirable plants suitable for different purposes.

First of all, the plants should be selected at a nursery as early as possible in order to prevent delay in transportation when the season for planting arrives, in order to secure the plants at the lowest prices and to enable the nurseryman to ship the stock at the earliest possible moment.

With the stock ordered, one's attention should next be directed towards obtaining the proper soil and planning for the location of the individual plants. Where extensive plantations or beds of definite design are contemplated, it is always advisable to prepare a sketch and to plan everything on paper before undertaking the actual field work. The planting accessories, such as spades, trowels, hand shears, etc., should also be provided. With these preliminary steps considered, we are now prepared to undertake the actual planting. We dig the hole and replace the old impoverished soil with rich mellow loam. We see that the roots are protected and kept moist from the time of their arrival until the time they are placed in the soil. Too much stress cannot be laid upon this point, because even a few minutes' exposure may injure the fibrous roots which are the chief feeders of the tree.

Before placing the tree in the pit, the roots should be examined, all bruised roots cut off smoothly and the ends covered with coal tar. This prevents root decay and stimulates the formation of new fibrous rootlets. The tree should then be placed in the hole at the same depth as it stood in the nursery. The roots should be carefully spread out and mellow soil worked in tightly with the fingers among the fine rootlets. Every root fibre is thus brought in contact with the rich soil. More good soil should then be added (in layers) and firmly stamped and, before the last layer is filled in, thoroughly watered. The last layer should remain loose, so that it may act as a mulch or an absorbent of moisture. The crown of the tree should be slightly trimmed in order to equalize the loss of roots by a corresponding decrease in leaf-surface. Where there is danger of swaying, the tree should then be fastened to a stake. These various stages of the planting process should receive particular care and attention.

What to Plant: There is often a wide difference in soil, moisture content and atmospheric conditions of locations which are not far apart. The plant suitable for one place may not suit at all for another place of similar outward appearance. I therefore hesitate very much to suggest any definite list covering all conditions and purposes. Yet a brief outline of the four most desirable trees for important special purposes may prove of service, and the following assortment is offered as a suggestion:

For city streets: Oriental Sycamore, Norway Maple, Red Oak, Carolina Poplar (where conditions for tree growth are unfavorable).

For suburban streets: American Elm, European Linden, Pin Oak, Sugar Maple.

For specimens on the lawn: European Beech and its weeping and cut leaf varieties, Pin Oak, Magnolias, Ginkgo or Maidenhair tree.

For evergreen screen: Hemlock, White Pine, White Spruce, Red Cedar.

For deciduous screen: Beech trees, Willow trees, Lombardy Poplars, Ash Leaf Maple.

For flowering trees: Dogwoods, Hawthorns, Magnolias, Horse Chestnuts.

For flowering shrubs: Azaleas, Forsythias, Weigelas, Spiræas.

Shrubs with colored berries: Barberry, Bittersweet, Coral Berry, Snowberry.

Trees that color in the fall: Sweet Gum, Andromeda Arborea, Japanese Maple, Sour Gum or Pepperidge.

Shrubs that color in the fall: Sumac, Enonymus Alatus, Viburnums, White Flowering Dogwood.

Trees and shrubs with interesting bark: White Birch, American Beech, Red Stemmed Dogwood (Siberica variety), Yellow Stemmed Dogwood.

Plants for covering the ground: Vinca Minor, Pachysandra, Honeysuckle, English Ivy.

Vines to hold banks: Rosa Wichuraiana, Hall's Honeysuckle, Matrimony Vine, Forsythia Suspensa.

For seashore planting: Willows, Silver-leaf Poplar, Mulberry, Hydrangeas.

Trees and shrubs for deep shade: Hemlock, Beech, Viburnums, Privets.

ADVICE FOR MARCH

1. Prune apple and pear trees. Remove all dead branches, thin out carefully and cut from the top and sides so as to form low, compact heads.

2. Before the leaf buds burst, spray for San José scale. It may be expected on fruit trees, lilacs, Japanese quince, dogwood, mountain ash, black and white ash, and elm. Use kerosene emulsion one to ten parts of water or some other well-recommended spraying preparation.

3. Remove and burn the cedar apples from the cedar trees. This will prevent the fungus from spreading to the apple trees and hawthorns in the summer time.

4. Prune the shrubs that bloom in the fall, but not the ones that bloom in the early spring. Examples of the former are hydrangeas and Rose of Sharon. Examples of the latter are Forsythias and spiræas.

5. Spray for cottony maple scale. One may expect this insect particularly on soft maples.

6. Prepare for planting. Order plants, have soil and manure in readiness and see that the tools are in good condition. In case of street tree planting also cut the holes in the sidewalk and prepare the stakes, guards, gratings and hose.

QUESTIONS AND ANSWERS

Q. I have a ranch in southern Kansas at the headwaters of the Medicine River, about two-thirds of the way across the state going west from the Missouri River. The climate is a typical continental climate, hot in summer and often quite cold in winter. There is generally a fair rainfall in spring and early summer, but from the middle of July till March there is generally comparatively little rain. Some of the land is irrigated, but most of it is not. Much of the land is broken, affording hill slopes with any desired exposure. There are canyons full of trees with walls fifty feet high. I desire to plant nut trees of all the kinds that I can hope to grow under conditions there and want necessary information as to where and how to secure the best seedlings and transplants, how many it would be desirable to plant of each species, and how and when this should be done.

E. D. R., *New Haven, Connecticut.*

A. We would suggest as the only practicable nut trees for planting in your locality black walnut, butternut, Japan chestnut and hickory. Young trees, either seedlings or transplants, may be had from nurseries in the prairie states, such as the D. Hill Company, Dundee, Illinois, or Storrs & Harrison, Painesville, Ohio. Planting is best done in the early spring, digging holes three feet wide and sufficiently deep to well contain the roots, using dynamite to break up troublesome rocks or hard-pan. Fill in with top soil, using no fertilizers, and leave a depression up the slopes to catch the rainfall. Keep circles three feet or more wide about each tree well cultivated for a year or more and protect from rabbits and vermin with wire or veneer tree guards. I would suggest planting about equal numbers of each species, setting the walnuts and hickories thirty feet apart and the chestnuts and butternuts twenty feet apart each way. You will note veneer tree guards advertised by the Burlington Basket Company in the December issue of AMERICAN FORESTRY.

Q. We have some pear trees about 20 years old, dying from what we thought to be pear blight, the trunks are dying. It's new to me, and I have not seen anything just like it. Is there another pear blight attacking in this way? I have been used to see branches dying back, which can readily be checked, but when the trunk itself gets diseased, it is a different proposition. Can you tell us what to do?

A. I am sorry to hear the condition of your trees, but last summer has been a very unfavorable season for pear injury such as you describe. It has been quite general in New York and Connecticut, affecting the trunks of the trees as well as the branches. Cutting out the affected parts is the best remedy we can suggest. Would also suggest that you call upon your State Agricultural Experiment Station to send a representative to examine the trees and advise you. This should be done next spring.

Q. Lawn bowling requires a green about 125 feet square, or larger. It seems a rather difficult matter to get it perfectly level and with the right kind of grass so as to make it perfectly level and true for lawn bowling, such as the greens they have in Canada, some of which are most beautiful and as level as a billiard table. If you have made any investigation of this subject and can give us any information, it will be fully appreciated. Will it be necessary to cover up for the winter a new lawn planted this fall, and what is the best way to protect it during the winter?

A. I am sorry to say that I have not been able to get any very definite recommendations, even from the experts here, with reference to overcoming the difficulties encountered in the preparation of your green for lawn bowling. I can say, in a general way, however, that the ground should be thoroughly prepared early next spring. Plow deep, put into the ground some well-rotted manure or some humus, and harrow. Then seed with a combination of red top, Kentucky blue, Rhode Island bent, and a little white clover—the first three in equal proportions. Then roll and do nothing further for winter protection. Under separate cover I am sending you a special bulletin relative to the cultivation of lawns.

Q. I should like to know which nut trees grow best in the vicinity of Sullivan County, New York.

Mrs. P. J. S., *New York City.*

A. You should have success with the cultivation of the following nut trees in the vicinity of Sullivan County, New York: English walnut, black walnut, pecan hickory (both shagbark and mockernut), butternut, and American beech.

Q. I own a summer home of about 26 acres, near Briarcliff Manor, N. Y. Having lost all my chestnut trees, I find that my hickory trees are now rapidly being destroyed by the borer. Last year I cut down and removed two fine trees, riddled with holes, and now I am losing another. What can I do to protect those still left? C. F. S., *New York City.*

A. I am sorry to know that you are losing your trees, and want to suggest the following three things as your best method of protecting the remainder. Mark all the hopelessly infested trees in the fall, before the leaves drop, and remove and burn these trees before the following May. This is the most effective and dependable method of all. It is difficult to tell an infested tree at this season of the year, but if you are sure of any, remove and burn them before May of 1917. Remove and burn the branches infested with these insects. Such infestation will become apparent and the branches will show themselves as dead or dying some time in September or early October. You might try spraying the more valuable trees with a special formula put up by the Interstate Chemical Company, Bayview Avenue, Jersey City, N. J. This should be done in early July. Would recommend you to a special article on the hickory borer, in AMERICAN FORESTRY for July, 1915.

Q. What is the best time to trim box hedges and how often should they be cut? B. R., *Plainfield, New Jersey.*

A. Box hedges can best be trimmed in early May when the growth first starts. Hedges should be sheared lightly. This work could also be repeated in August, but the early spring is the best time.

Q. I would like to get some advice on the transplanting of three arbor-vitæ trees which I must remove, as they are directly in line of where I am going to move a house; these trees are 35 to 50 years old, about 12 inches in diameter at the base and 30 to 40 feet high. Is it possible to move trees this size and this specie with any certainty of their living? I also have a large white birch about 30 feet high and about 15 inches in diameter, a maple about a foot in diameter, and an Italian chestnut about

the same in diameter, but of course not so high, which I want to transplant. If you can give me any advice as to how this work should be done, I would greatly appreciate it. They have to be moved within the next couple of weeks, and I would like to know about how far from the trunks these roots should be cut, and whether it is advisable to take the trees up now with whatever dirt that would adhere to the roots, or dig a ditch around and wait for a ball to freeze, putting manure and other protective material in the ditch as a protection from frost for the ends of the roots. C. H. S., *Noroton, Connecticut.*

A. It is not a very easy matter to transplant arbor-vitæ trees as old as yours, but with proper methods and care it can be done with a great degree of safety. These trees should be moved with an unbroken ball of soil at least 8 feet in diameter. It would be necessary to dig a trench around the trees about five feet from the trunks and then, in lifting the trees, barricade the ball so that it will not break in the process of transplanting. Messrs. Isaac Hicks and Sons, of Westbury, Long Island, N. Y., and Messrs. Louis and Valentine, Roslyn, Long Island, make a specialty of moving trees of that size, and if you write to them about it I am sure they can do the work in a most satisfactory manner. The white birch about 30 feet high is a more risky proposition to transplant at this time of the year, and I doubt very much whether you can save it. The maple and the chestnut can be moved in the same manner as the arbor-vitæ. It is too bad if these trees have to be moved at the present time, for if the work could be postponed to the early spring it would be a far more ideal time to do it.

Q. I desire some information regarding trees. On a farm near here trees will not grow. The people have tried several kinds, but all die off in no time. The soil is sandy. Long ago the valley was a lake. There is about three inches of real loam on the top and all the rest down is sand. Water is reached at from eight to ten feet. Terrific storms sweep over the valley both in summer and in winter. Farmers in that valley would like to plant trees as a wind-break and also to make the home look better. The winters are very cold and the sand is cold in winter, spring, and autumn. One farmer who has heard that certain chestnut trees stand cold well has thought of planting some. Now can you tell me what trees would be good for that kind of conditions? The soil seems to lack humus or something, for no matter how much you fertilize, it does not seem to decay and mix with the soil at all. M. S., *Greeley, Colorado.*

A. I do not see why trees that thrive in the region about Greeley should not succeed on the farm you mention. The honey locust, especially the thornless variety; the hackberry, including the common hackberry and the Mississippi hackberry; the black locust, the green ash, and, where it is possible to supply water for the first few years, the American elm, are the trees that we suggest for this part of the country, and they seem usually to succeed. Have you tried any of these? If you have, and they have failed, there must be some other unusual local condition that is the cause of the difficulty. Soil of the character you describe needs the addition of all of the organic matter that it is possible to incorporate with it.

Q. Your December number suggests fertilizing with well-rotted manure the soil about trees requiring nutriment. This I have tried, but with, in my opinion, very poor results—excellent to the surface soil—but distinctly questionable as regards the trees themselves. It is difficult by this means to penetrate through the sub-soil to the fibrous roots, whereas if holes were bored with a sharp crowbar, working the bar when driven, making the aperture larger at the ground surface, and the holes driven a few feet inside of the greatest circumference of the branches and these filled at the season with a proper fertilizer, infinitely better results should be obtained; but the question arises, what combination should be used? I have asked various authorities and all suggest something entirely different from the other—one even suggesting Rochelle salts, which he has used with wonderful results. I would much appreciate any suggestions you might offer in this connection, as I have many white pines, oaks, maples, and elms that require drastic treatment, if they are to be saved. Would you think well of cow manure, ground bone-meal, and phosphates mixed in suitable proportion?

H. F. G. W., *Rye, New York.*

A. My idea of fertilizing trees with well-rotted manure is to dig a trench from two to four feet wide around the tree at a distance of four to six feet from the trunk. The trench should be about two feet deep and filled with one-third well-rotted manure and two-thirds good soil. Then I would place manure in narrow trenches running like the spokes of a wheel and radiating from the main trench toward the trunk. I have done this for twelve years to the trees in Prospect Park, Brooklyn, of which I have had charge for that period, and also to many of the trees in New York City, and always found this method to work well. My idea in using manure rather than commercial fertilizer is to supply the roots not only with plant food, but also to make that particular part of the soil serve as a mulch for the retention of moisture. After a while the roots penetrate into this new rich layer and form many new fine fibrous rootlets, and this is exactly the kind of action intended to stimulate by digging the trench and practically root pruning many of the large roots. I have even carried this sort of work to valuable evergreens, such as cedars and pines, by the thousands on 60 or more of the largest estates on Long Island. On Mr. C. Oliver Iselin's estate we have treated a whole cedar hill of large extent in this way. The idea of using commercial fertilizer such as bone-meal, phosphate, muriate of potash, etc., is very serviceable in many cases, but more to stimulate growth rather than to produce a permanent improved condition of the surrounding soil. I have used the commercial fertilizers in very large quantities, even this fall, but in each case with special care and for a special purpose.

Q. I have had a granolithic walk laid close by a line of fine elm trees. The work was done some years ago, and in order to get a suitable foundation, many elm roots were cut away. Since that time many small branches of these trees have died, and I suppose on account of the loss of roots. Can anything be done to preserve the trees now? B. P., *Brunswick, Maine.*

A. The death of small branches on the elm trees is very likely due to the earlier cutting of the roots. Perhaps when larger roots were cut they were not covered with coal tar and have in consequence started to decay. This would be a very difficult condition to overcome at this time, except by exposing these wounds and treating them. If decay did not set in, then the best thing to do is to dig in well-rotted manure around the ends of the roots, especially on that side of the tree where there is a chance for new rootlets to form. This will stimulate root formation. The trees are very likely also suffering from drought, and thorough cultivation and watering of the ground around the base of the trees to a distance of at least eight feet from the trunks in the summer months would do much to keep many of the branches alive.

Q. Can you tell me what a concrete storage house for a 10-acre nursery would cost and how large it would be? I would also like to know how many apple, peach, and pear trees can be grown to the acre in the nursery row. All I care for is the approximate number. A. H. H., *Detroit, Michigan.*

A. Replying to your inquiry relative to a concrete storage house for a 10-acre nursery, I would say that it would cost from $500 up, but the best thing you can do is to get quotations from firms specializing in this sort of work.

Apple and pear trees should be planted twenty to twenty-five feet apart, in alternate rows, with about twelve feet between the rows. Plant peach trees about ten feet apart. I am sending you a bulletin on fruit cultivation.

EDITORIAL

EFFICIENCY AND ECONOMY IN OREGON

FOR several years prior to 1911, the state of Oregon managed its forest fire protection under a state official who combined the functions of forest fire warden with those of fish and game protection. His field force was supposed to fight fire, and at the same time to enforce the game laws. This plan has met with enthusiastic advocacy of efficiency and economy commissions and others in many states, but has been universally opposed by foresters on the ground that it is inefficient, and that men burdened with both of these lines are neither good fire wardens nor good game wardens.

But for the time being, consolidation won, and one man managed two departments, thus saving the state at least $2000 in overhead expense. But, unfortunately, the forest fires continued to burn despite the alleged advantages of combinations. In the final year of this disastrous period of 1910, Oregon lost timber valued at $1,640,997 on the stump—a loss which must be multiplied by five when we consider its value in wages and products for manufacture. The average annual loss for the three years 1908, 1909 and 1910 was $663,935, and the total $1,991,806.

In that year, the people of Oregon, having for the time being had enough of combination commissions as a means of fighting fires, decided to specialize. A separate forestry board of seven unpaid members was created, the Agricultural College, the State Grange, the State Forest Fire Association, the Wool Growers' Association, the Lumber Manufacturers' Association, and the United States Forest Service being represented. The Governor was a member of the Board. This Board was given power to appoint its own executive agent, who should be the state forest fire warden, free from political pressure and with no duties other than to see that forest fires in Oregon were suppressed.

During the six years following, under this system, with conditions fully as hazardous, the annual loss from fire has been but $16,254, which is 2½ per cent of the average for the three previous years, an increase in efficiency of 4000 per cent. This state work is conducted at an expense to the state of about $17,000 per year, out of a total of $93,000, the remainder being furnished by land owners, and by Federal coöperation, in the knowledge that it is well spent and efficiently administered. The losses in 1915 were but $9333, and in 1916, $905. In spite of this fact, the legislature two years ago again endeavored to combine this department with others under one of the familiar efficiency and economy programs, and only the desperate resistance of those whose interests lay in securing actual protection of state timber from fire secured the defeat of the measure.

But neither Oregon nor any other state in which forestry, under the Board system, has by the employment of technical men reached a condition of true efficiency, need hope to avoid further well-meaning but misguided efforts at improving the machinery of government, until the whole matter is threshed out and the public at large recognizes the serious flaws which cause this theory of combination to fail in practice. That this leaven of education is working in Oregon is evident. In the **Oregon Voter** of January 27th appears the following:

CONSOLIDATION

"In this mania for consolidation of state officers and commissions, would it not be well for thoughtful people to consider whether the interests of true economy and efficiency will be advanced by wholesale bunching?

"Is one paid political appointee or a paid commission likely to be more economical in the conduct of a lot of state work **with which he or it is entirely unfamiliar** than would be separate unpaid commissions, the members of which are devoting time, energy and judgment to doing public work well for the sake of the public weal?

"Many of the commissions which it is proposed to consolidate are doing splendid, efficient work, because **the members of those commissions understand what they are doing and have their hearts in the work. Will there be economy in centralizing this work in the hands of a few who have no enthusiasm for it or interest in it beyond that which is hoped for from paid appointees?"**

On this basis, backed by observations of the actual experiences in the thirty or more states which have forestry departments, the American Forestry Association is vigorously opposing the proposed consolidation of forestry with other state departments, especially in Minnesota, Indiana and Vermont, which are now before the legislatures of those states. True economy and efficiency in state departments does not consist of eliminating the boards of directors for important state enterprises, boards of men carefully selected and appointed without salary to supervise the work in the public interest and to substitute therefor a single high-salaried appointee, who, unless all precedents fail, must inevitably be more or less influenced by the system of party spoils to which he owes his office.

If what we have is good, let us hold fast to it, and by demanding cause for every change proposed, force the movement for consolidation to proceed along lines which will safeguard and improve the public welfare, instead of plunging the entire fabric of the state machinery into a political abyss from which it may take a generation to recover.

INCREASING THE GRAZING FEES ON NATIONAL FORESTS

THE growing efficiency with which national property in the West is being administered is nowhere more strikingly shown than in handling the grazing business on the National Forests and Indian Reservations. The policy of charging fees for grazing, inaugurated by the Forest Service in 1905, was later adopted by the Department of the Interior on the reservations, but was never extended to the public lands.

Grazing privileges on Indian lands are auctioned to the highest bidder under sealed bids on five-year contracts. In this way the market value of the grazing is actually secured. But the system inevitably leads to few and large units, controlled by the larger and wealthier organizations or individuals. The method brings in the maximum revenue to the Indian funds at least expense for administration.

The Forest Service has pursued a different policy. Not having the Indians as their sole beneficiary, they were guided by the principle of the greatest good to the greatest number. In contrast to Indian Reservations, National Forests are opened to settlement wherever agricultural lands are found within their boundaries. One of the chief sources of income for the homesteader is grazing. But he has at most but a few head of stock, and his chances in the free-for-all scramble on the public range are very poor. A policy of large units, auctioned grazing privileges and fencing would inevitably freeze out the small man on National Forests.

To prevent this, the Forest Service created preferential rights in favor of the settler and home-builder. Ten head of stock are grazed free. The remaining carrying capacity is distributed, first to the settler and what is left goes to the stockmen with larger herds or flocks. Grazing permits are for one year, and, to make room for new homesteaders, the number of stock grazed on a permit may be reduced, this reduction to fall on the larger permittees. Under this system, the Forest Service now issues 33,300 separate grazing permits.

Meanwhile, the grazing privilege became more valuable for many well-known causes, chief of which were the growing scarcity of free range and the higher price of meat. The prices received for grazing on Indian, state, railroad and private lands rose accordingly—the fees charged on National Forests remained stationary. Finally, the discrepancy became too great to be further tolerated and the Service gave notice of an increase, which in three years' time would double the present scale of charges.

The various livestock associations uniformly protested against this increase, but the stockmen were united in support of the system, at the established rates! To quote from a pamphlet recently issued by a stockman in Arizona:

"The Forest Service have promulgated and have now in force a regulated system of grazing on their Forests of which they may justly be proud, covering an almost unbelievable range of conditions as wide as this great country itself.

"The stockmen do not fear, but favor the regulation of their business based upon fairness and the greatest good to the greatest number."

But they quite naturally desired to secure these privileges at as low a cost as possible, and if protests would accomplish this, they were going to protest.

So long as exclusive fenced units are denied, and the gateway of opportunity held open for new permittees, National Forest grazing privileges are not worth as much per head as Indian or private grazing. But the Forest Service should not permit unfair privileges by allowing grazing on these Forests at less than real value. Not only is the Government at present meeting an annual deficit of over $2,000,000 in administration while the stockmen get grazing for half what it is worth, but the states, through their county, school and road funds, lose 35 per cent of the gross revenue which they should receive from this source in lieu of taxes on the grazing lands.

The result of this agitation was not all that the friends of the National Forest Administration could wish. In spite of the testimony of the grazing experts of the Forest Service, the Department of Agriculture, after a final hearing, reduced its proposed increase from 33⅓ to 25 per cent, and declared that further increases should be contingent upon future investigations of the actual value of the grazing privileges on each separate forest. Encouraged by this success, the agitation against these normal increases is bound to continue in full force.

In these contests between interests which have special privileges to defend, and the public, it too often happens that the special users are well organized and ably represented, and that the interests of the general public do not receive as vigorous and adequate a presentation as they should. The American Forestry Association desires to see such of our national resources as are retained in public ownership administered in absolute fairness to the user. But in a competitive commercial business such as grazing, or timber sales, justice, both to the public and to other individuals in the same business, demands that forage as well as timber be sold for as nearly as possible what it is actually worth.

CONSERVATION of life and limb in the lumber industry is said to be one of the biggest problems now confronting the nation's lumbermen. Habitual carelessness is reported responsible for ninety per cent of all industrial accidents, and the subsequent condition of the injured, involving lost time, lost faculties, and even loss of life, depends on proper attention the first few minutes after an accident, pending the arrival of a physician.

OFFICIALS of the Pennsylvania Department of Forestry are much encouraged by the replies received to a circular letter on reforesting, addressed several weeks ago to all the water companies in the state. To date, ninety-five water companies have written to the Department stating that they are interested in restoring tree cover to the hills on their watersheds, and applications are listed for over 100,000 trees to be used for this purpose.

Forest Fire-bugs Prosecuted

Setting forest fires in Pennsylvania is no longer the pleasant pastime it used to be. Since the legislature of 1915 put teeth into the forest fire law and provided for the establishment of a bureau of forest protection within the Department of Forestry, more prosecutions and investigations in connection with forest fires have been started than in all the previous years since the creation of the Department. In all, thirty-six cases were referred to the Attorney General's Department by the Commissioner of Forestry during the past year. Legal action was authorized in nineteen of these cases. Four convictions have been secured to date, thirteen cases are still pending, and there have been but two acquittals. In several additional cases criminal action was not directed by the Attorney General because of the extreme poverty of the defendants and the absence of evidence of criminal intent in setting forest fires.

Red-rot in Arizona and New Mexico

A recent survey of the forests in Arizona and New Mexico, conducted by the United States Department of Agriculture, indicates that the existence of what is known as Western red-rot causes a considerable amount of loss to lumbermen in these states each year. It is said that the percentage of trees found to be infected with this disease varies. No external signs were found which could be relied upon to inform the observer whether or not a given tree was attacked by the disease. It was found, however, that trees growing on very thin soils on steep south or east slopes where growth conditions are poor, appear to be more likely to have the disease than pine situated where growth conditions are good.

Furthermore, it was ascertained that the disease was much more prevalent among the mature yellow pines than among the younger trees or black jacks. Any system of cutting, says the new publication, that will take out most of the older trees (yellow pine) and many of the larger black jacks, as well as all suppressed trees, will do much to rid the future forests of this serious heart-rot. From this point of view, a short rotation is better for the future health of the forest than a longer one.

Tree Service for Houston

The Public Parks Department of the City of Houston, Texas, is rapidly awakening to the need of more trees and of better tree service for the city. The result is that many trees are being planted, not only in the parks but on the streets and boulevards. This city recently planted one vista in the new Hermann Park with a bordering of Bald Cypress (*Taxodium distichum*). The planting required 415 Bald Cypress, ranging in size from 5 to 16 feet and from one inch to two and a half inch caliper. A plantation of this kind of tree, even in the South, is somewhat unusual.

The Parks Department is now receiving 500 live oaks, 1 inch caliper, 5 to 7 feet, and 1½ inch caliper, 7 to 9 feet, which are being planted in a double tree line on the new Main Boulevard along the Hermann Park front. The Board of Park Commissioners decreed that nothing but live oaks should be used for the entire length of this boulevard, and this action has caused a greater activity in the planting of trees on this boulevard.

During May, June and July, 1916, more than 200 large oak trees were moved back, to allow a widening of this boulevard and up to the present time less than 5 per cent of these trees have died, though they were removed at an unseasonable time, and it is considered somewhat remarkable that so many of them have lived.

The Public Parks Department of the city has recently started a nursery, in which will be grown all the trees, shrubs and plants that will be used in all the parks in the city, including the new Exposition grounds. A city tree warden will be appointed this year to care for all of the trees under the direction of Park Superintendent C. L. Brock, and steps will immediately be taken to map and index every street in the city, showing all trees.

Forests as Playgrounds

Devoting much space to the importance of National Forests as playgrounds, *The Railroad Red Book* for January has special articles with several pictures by Smith Riley, district forester, U. S. Forest Service, W. B. Fraser, state game and fish commissioner of Colorado, and T. J. Ehrhart, state highway commissioner. In the article on National Forest playgrounds accessible by the Denver & Rio Grande railroad, Mr. Riley writes:

"The popularity of the National Forests as summer playgrounds is increasing by leaps and bounds each year. These vacation wonderlands were visited by over 2,000,000 people in 1916. Of this number Colorado received 605,000 or 30 per cent of the total."

Hunters Get 618 Bucks

Six hundred and eighteen deer, 549 turkeys, 37 bears, 1084 coyotes, 117 wolves, and 48 mountain lions were killed by hunters in the New Mexico National Forests during the season just passed, according to the District Forester's annual report on game conditions just submitted to the State Game Warden.

"The number of deer killed is 5 per cent less than in 1915, 4 per cent less than in 1914, and 7 per cent less than in 1913," says District Forester Redington. "It is safe to assume that the number of hunters has increased. It would seem, therefore, that these figures indicate a steady decrease in the supply of deer. The number of turkeys killed also shows a decrease as compared with 1915. Some people still believe that the game protectionists are alarmists, but these figures speak for themselves, and to the contrary. They emphasize the need for game refuges, better laws, and above all better law enforcement."

The report shows that the number of predatory animals killed has more than doubled as compared with 1915. Forest officers attribute this to the work of the Government trappers employed by the United States Biological Survey, and regard it as about the only encouraging feature of the report.

BOOK REVIEWS

The latest publication of the Bureau of Forestry of the Philippine Islands, Bulletin 14, entitled "Commercial Woods of the Philippines: Their Preparation and Uses," is just out. This is by far the most comprehensive work so far published on the subject and, from the point of view of the wood-user, also the most practical. The book consists of five parts dealing with different phases of the subject. Part I is a concise description of the forests and of lumbering conditions in the Islands; Part II, a discussion in popular language of the physical and mechanical properties and the structure of wood; Part III, a very comprehensive discussion of uses, the different purposes to which wood is put being arranged in alphabetical order, with frequent cross-references; Part IV gives, also in the least possible technical form, directions for the identification of wood; and Part V, which occupies more than half of the book, gives detailed descriptions of about 360 Philippine woods, with notes on their mechanical properties and workability, their distribution in the Islands, local names, uses, supply and approximate prices. There is also a general index, one of scientific names and one of all the official, commercial and local names.

Lumberjack Bob, by Lewis H. Theiss. W. A. Wilde Company, Boston, Massachusetts. $1.25.

This is a book which describes the experiences and the adventures of a young lumberman and forester in the woods, and, with a style of narrative which carries the reader along in a manner which sustains the interest throughout, manages to convey lesson after lesson of the trees and the woods. It is enticing to young people as well as adults, and instructive to both. The author is to be complimented upon his ability in presenting so much valuable information in so attractive a manner.

CANADIAN DEPARTMENT

ELLWOOD WILSON

SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

The recent meeting of the Canadian Forestry Association in Ottawa was a very successful one. The chief topics of discussion were the white pine blister rust and the proper disposal of débris left by logging operations. The inroads the blister rust is known to have made have not been extensive, but further examination may show other affected areas, especially on the south shore of the St. Lawrence River, near the northern boundaries of New Hampshire and Vermont. The main areas at present affected are the Niagara Peninsula, the Trappist Plantation of pine at Oka and a small area near Montreal. None of these is threatening from the standpoint of merchantable white pine, but must be watched to prevent the spread into the forests. A resolution was passed asking the Dominion and Provincial Governments to make the necessary appropriations for scouting and prevention. The question of the disposal of logging débris came up for discussion and it was pretty generally conceded that burning is the best method and that it is very important from the standpoint of fire protection and protection from insects. The Dominion Entomologist says that the logging débris is one of the best breeding grounds for insects. A committee was appointed to study these matters thoroughly and to report later. The same committee will take up the question of the introduction of civil service regulations in the outside service of the Dominion Forestry Branch and the Forestry Branches of the Provincial Governments which have not already been put on that basis. The banquet held in the evening was a very successful and enjoyable one and the speeches were better than the year previous.

At the meeting of the Commission of Conservation questions of general interest were discussed, including agriculture, fisheries and forests—the proper planning of towns and cities. This latter subject is one of the most important of the activities of the Commission and does not mean simply the making of ground plans for cities, but the proper planning for all the activities which make up the life of the community. Proper location of manufacturing and residential quarters, parks, playgrounds, etc., in accordance with the topography of the site selected and for the greatest efficiency of community life. Planning for proper drainage, streets, water-works and power and light lines. The work also covers villages and farming sections so that the agricultural population will have proper roads and that the farms will be laid out to give the right proportion and location of arable land, pasture and woodlots and will have accessible schools, churches and railway stations. All over the country the sole reason for the lay-out of our towns and cities and farms seems to have been to make it easy for the surveyor. No one seems to have used any imagination or foresight.

Several very important recommendations in regard to necessary forestry work were made by the Commission: that the Government of New Brunswick should consolidate its present forestry and fire protection work under a central organization with properly trained staff: that Ontario should endeavor to organize coöperative fire protective associations to work with its fire protection Branch: that Quebec should take better measures for the protection of its forest lands not yet under license: that Nova Scotia should appoint a trained Forester: that British Columbia should start a forest school: that the Dominion Government should put into force proper forestry regulations in connection with cutting operations on licensed timber berths, with a view to ensuring the perpetuation of the forest; and that both Dominion and Provincial Governments should put into force regulations which will place their forestry and fire protection systems on the basis of appointments and promotions for merit only.

The report of the Commission of Conservation upon the investigation of the forest resources of British Columbia is nearly completed and will soon be ready for publication and also the report upon the forest resources of Saskatchewan. An investigation of the condition of cut-over pulpwood lands, the timber left, the increased growth after the thinning of the stands, the amount of the probable future cut after periods of years and other matters in connection therewith will be undertaken during the coming summer in coöperation with the Laurentide Company, Limited, and the Canadian Pulp and Paper Association.

There is a great necessity for the foundation of a really good ranger school in Canada. We have enough schools to turn out trained foresters, but there are no men who can fill the places of rangers acceptably—every forester must train his own. The teaching in such a school should be eminently practical and should aim at giving the class of men who work in the woods the theory of elementary surveying, forest mensuration, English and French, simple accounting and mathematics. They should also be trained in woodcraft. This sounds strange, but it is a fact that men who have lived and worked in the woods all their lives are strangely deficient in some branches of this art and in trained observation. They have many superstitions.

The Annual Meeting of the full Pulp and Paper Association and of the Technical Section in Montreal was most successful. The reports of the various sections showed much work accomplished during the year past and much benefit from coöperation and the exchange of ideas. Especial interest was shown in forestry matters and some work will be done along this line during the coming year. At the luncheon, Sir George Foster, Minister of Trade and Commerce, made a most excellent speech in which he told the members that trade after the war would be large and would require that they prepare early for it and coöperate in handling it. He also said that while the surplus of exports over imports was very large now owing to war conditions, after the war it would drop back and with our heavy war debt we must work hard and increase production and export so as to make the balance of trade in our favor.

On February first and second at the Windsor Hotel in Montreal was held the first Forest Protection Conference ever held in Eastern Canada. All phases of forest protection were discussed, from fire, from insects and from fungi. The white pine blister rust came in for much discussion. The problem of slash burning as a fire preventive measure and also as a means of preventing insects from increasing was touched upon and different views brought out. The use of aeroplanes for discovering and locating forest fires and the use of telephones in reporting them and summoning aid were interestingly presented. The development of mechanical aids to fire fighting was shown and much interest was excited by the Johnson portable gasoline combined engine and pump, weighing only about 150 pounds. This pump was in use during the past season by the Dominion Parks Branch and the St. Maurice Forest Protective Association and did splendid service in checking fires which would have otherwise required large crews of men to prevent from spreading and so saved large sums of money which would have been spent in fire fighting.

M. Allerdale Grainger, for the past two years acting chief forester, has recently been gazetted upon his appointment as chief forester, in succession to H. R. MacMillan.

Dr. W. W. Walkem, in an article appearing in a recent issue of the *Vancouver Daily Province*, gives a striking instance of the durability of Douglas Fir. In the course of some excavation work between Vancouver and New Westminster, a Douglas Fir several feet in diameter was found buried under twenty feet of water-washed gravel and sand, overlaying glacial-worn rocks and moraine, presumably contemporaneous with the glacial period. The tree had to be crosscut twice to permit the passage of the steam shovel, and the wood was found to be perfectly sound. On the surface were other fir trees growing which were many centuries old.

FOUR COLONIAL HOUSES

BY RAWSON WOODMAN HADDON

THE way by which we may preserve in the domestic architecture of today an undefinable charm—a certain warmth of personality with which American history has invested the wooden house—is what Mr. Joy Wheeler Dow shows us in the buildings he has designed, and in his writings upon the various developments of American architecture, both historic and modern.

"KEEPSAKE," AT MARQUETTE, MICHIGAN

To secure this charm — to build a certain amount of convincing historical atmosphere into the house without losing any of the comforts that we have learned to expect in houses of today, and still preserve the splendid qualities of the original Colonial building, is the especial task that this architect has set for himself. How well he succeeds and by what means, we shall see.

In the very first place materials must be selected with care and with a full knowledge of the possibilities of every available source of supply. In the present instance, in addition to being an architect of wide experience, the designer of the houses here illustrated is the author of "The American Renaissance," one of the best-known books on American architecture, and his word, both in his books and as exampled in the houses he has designed, carries with it an authoritativeness recognized by architects and homebuilders alike.

For this reason it is interesting to know that he says, in connection with the selection of materials for the new house, that "if we go further, and by means of accumulated affluence erect the entire structure of the new colonial house in stone —columns, cornices, window and door casings, etc., strange to say we lose an indefinable charm — a certain warmth and personality with which American history has invested wood."

Undoubtedly we do. And the loss is not owing simply to the fact that we have failed to use wood where our forefathers used it, but it is because the wood we have not used has been tried and found since the earliest days of American building to be the ideal building material in this country for reasons of looks, and because of its comparatively low cost and plentiful supply, and for economy of maintenance and repair.

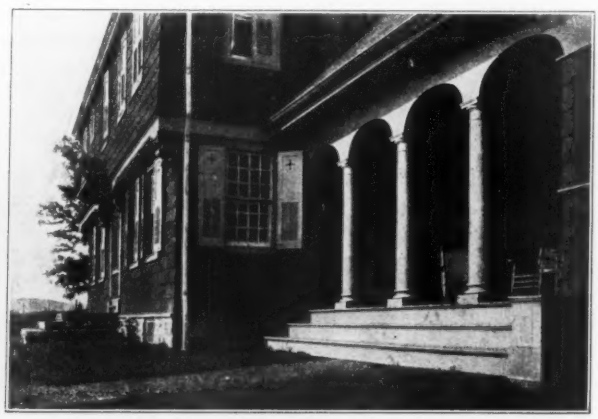
THE BISHOP HOUSE, NORWALK, CONNECTICUT

THE SWARTZ HOUSE, NORWALK, CONNECTICUT

"Keepsake" at Marquette, Michigan, has been known —since it was built in 1913—as one of the most successful buildings yet erected which is based on the

Colonial house of the earliest type. It reproduces the general characteristics of the houses built during the days of Hawthorne's "Scarlet Letter." It fairly breathes the spirit of Salem witchcraft days, and "Colonial governors who sheltered the regicides, or indeed Whalley and Goffe themselves, might for all we know"—save that the house is not quite five years old—have found refuge in it.

FRONT VIEW, "WITCHWOOD," HIGHLAND MILLS, NEW YORK



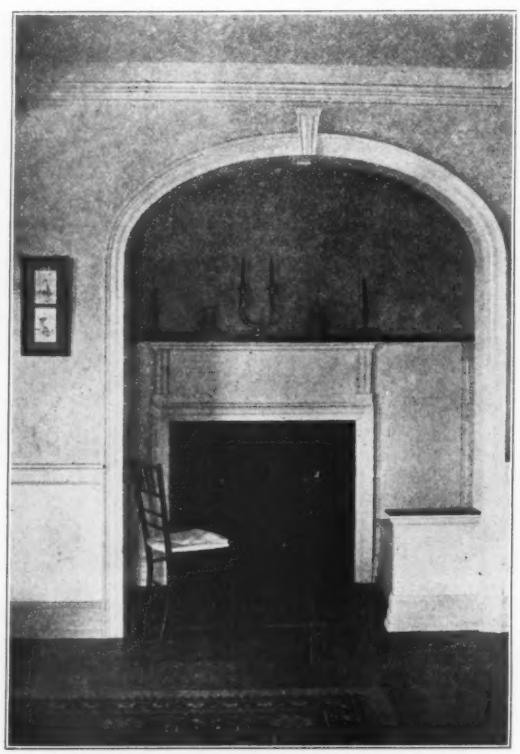
DETAIL OF THE PORCH AT "WITCHWOOD"

The means taken to secure this family resemblance to houses of two and a half centuries ago were neither costly nor complicated. In the first place the exterior clapboards, which are cypress, have never been painted. After the completion of the work, they were simply oiled to preserve the wood and to bring out its fine natural color.

On the side of the house it will be noticed that the clapboards in the gable are wider than those below. The upper ones are eight inches wide and the lower ones are four. These lower boards are beaded, or moulded, on the lower side, as most early siding was.

On the whole, no tricks or "stunts" of design were attempted and the building from top to bottom was simply patterned after the usual manner of early work. An overhang at the second floor (see page 181) is designed as all old ones were. The windows in the first floor rooms are brought high up in the room and well under this overhang, and at the second floor the windows are near the cornice. The brackets under the overhang were carefully designed after the study of many historic examples, and a typical chimney, large enough to accommodate many large fireplaces, was used.

The construction inside "Keepsake" is the same as that found in the old houses of Salem and other New England towns. And yet, remarkable enough, the cost of this house, with all its good design and construction, was not as great as that of the poorly built and still more poorly designed "Colonial" houses found in every suburb and small (and large, too, for that matter) city or town. Its cost, at a time however when labor and materials were less expensive than they are at present, was $6000.



FIRE-PLACE AT "WITCHWOOD." THE CANDLE-STICKS, MUGS AND THE CHAIR ARE UNFORTUNATE; NONE ARE COLONIAL

Another successful example of early design is "Witchwood" at Highland Mills, New York. In this instance the building might have been put up as late as 1700, or in the "Middle Period" as architectural historians call it. The doorway is an unusually successful one of its kind, and the treatment of the porch at the side of the house is well worth study—and reproduction on houses that make no pretence of being Colonial.

The Bishop house at Norwalk, Connecticut, is an example of a later type. The roof is reminiscent of those found in certain parts of the South. The sides of this house are covered with hand-riven white pine shingles laid nine inches to the weather. Both here and at the Swartz house the roof shingles are cypress. The interior trim of both is white wood, painted, and the floors are oak. In the Swartz house the stairs are oak and the handrail is mahogany. The Swartz house, built in 1907, cost $12,000, and the Bishop house which was built a year earlier cost $11,000.

(Continued from page 182)

Correct design, of course, and strict attention to historic examples, are the things that make the new Colonial house a success or a failure. And also, as has already been said, the materials used in the building must be selected with the greatest care.

"In English Renaissance," says the architect, "local conditions commonly restricted the use of wood to the interiors. In American Renaissance (that in our own Colonial style) the plentitude of this material enabled the Colonial builders to use it for the outside as well, and with great advantage, for it permitted the Colonist to elaborate the elevations of his dwelling, gaining thereby warmth, cheerfulness and grace, and all easily within his means. Without the slightest danger of bankruptcy he could proceed to embellish the curtilage with arched gateways, ornamental fences, terrace rails and summer-houses *ad lib.*"

No wonder then that in early American villages are found so many splendid houses (large or small) that have remained to this day as a model after which the houses of our own time may be patterned, with, however, it is sad to say, sometimes but indifferent success. And no wonder, in view of this realization of the faith that earlier designers had in wood, that practically all of Mr. Dow's most successful houses have been built of that material. And quite naturally of wood, too, for "there was no bit of classic detail from either Athens or Rome transmitted to London" (and from there to America where the Georgian architecture of England became, in course of translation or transplantation, the Colonial architecture of New England) "through what I may call the 'Florentine Clearing-house' presided over by Palladio, Sansovino, Scammozzi and their contemporaries, but what would be carved more readily in wood; and time and history have thrown a glamour over all this wooden development of ours and established its right of succession with a hall-mark."

Blasting Tree Holes

"I recently visited Prof. C. B. Waller, Instructor in Chemistry at Wofford College, Spartanburg, South Carolina, writes J. C. Ahl, "I found him to be an enthusiastic advocate of dynamite for blasting tree holes. It seems that recently he planted fifty pecan trees in some hard clay soil. He had read something about the advantages of using dynamite in tree planting and decided to try it. The orchard site was laid out in sections. At each intersecting point, a bore hole was put down to a depth of about thirty inches, each hole being charged with a quarter of a pound of 20 per cent dynamite. When these holes were dug out just before planting the trees, it was found that the blasting had shattered the hardpan very nicely. The blasting also saved a good deal of time and much hard work. The use of dynamite for tree planting is becoming very general all through this section of the state."

CURRENT LITERATURE

MONTHLY LIST FOR FEBRUARY, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

Forestry as a Whole

Proceedings and reports of associations, forest officers, etc.

India—Forest department. Annual return of statistics relating to forest administration in British India for the year 1914–1915. 25 p. diagr. Simla, 1916.

New South Wales—Department of forestry. Report for the year ended 30th June, 1916. 17 p. pl. Sydney, N. S. W., 1916.

South Australia—Woods and forests department. Annual progress report upon state forest administration for the year 1915–16. 13 p. pl. Adelaide, 1916.

Southern forestry congress. Proceedings held in Asheville, N. C., July 11–15, 1916. 187 p. Chapel Hill, N. C., 1916.

Texas—State forester. First annual report. 16 p. College Station, 1917. (Texas—Agricultural and mechanical college—Dept. of forestry. Bulletin 4.)

Washington—State board of forest commissioners. Annual reports of state forester for the years ending Nov. 30, 1915, and Nov. 30, 1916. 41 p. pl. Olympia, Wash., 1916.

Western forestry and conservation association. Proceedings, 1916. 29 p. il. Portland, Ore., 1916.

Forest Education

Arbor day

Newark, N. J.—Shade tree commission. Arbor day, 1916. 20 p. il. Newark, 1916.

Forest schools

India—Forest research institute. Progress report for the year 1915–16. 21 p. Calcutta, 1916.

Forest Description

Massachusetts—State forester. The forests of Worcester county, by H. O. Cook. 88 p. pl. Boston, 1917.

Forest Botany

Burbank, Luther. The birth of a new industry; the Burbank royal walnut, a new timber tree for both beauty and profit. 8 p. il. Santa Rosa, Cal., 1916.

Burns, G. P., and Otis, C. H. The trees of Vermont. 244 p. il., pl. Burlington, Vt., 1916. (Vermont—Agricultural experiment station. Bulletin 194.)

Going, Maud. Our field and forest trees. 222 p. il., pl., map. Chicago, Ill., A. C. McClurg & Co., 1916.

Rock, Joseph F. The sandalwoods of Hawaii; a revision of the Hawaiian species of the genus Santalum. 43 p. il. Honolulu, 1916. (Hawaii—Board of agriculture and forestry—Division of forestry. Botanical bulletin No. 3.)

Forest Investigations

Algeria—Service des forêts. Bulletin de la Station de recherches forestières du Nord de l'Afrique, v. 1, No. 4. 22 p. pl. Alger, 1916.

Harshberger, John W. The vegetation of the New Jersey pine barrens; an ecological investigation. 329 p. il., pl., map. Phila., C. Sower Co., 1916.

Silvical Studies of Species

Munger, Thornton T. Western yellow pine in Oregon. 48 p. pl., map. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 418.)

Forest Influences

Dana, Samuel T. Farms, forests and erosion. 28 p. pl. Wash., D. C., Gov't. printing office, 1917.

Hill, M. Note on an enquiry by the government of India into the relation between forests and atmospheric and soil

moisture in India. 41 p. maps. Calcutta, 1916. (India—Forest dept. Forest bulletin No. 33.)

Silveira, Alvara A. da. As florestas e as chuvas. 54 p. pl., map, diagrs. Bello Horizonte, Brazil, 1916.

Silviculture

Planting and nursery practice

Conklin, W. Gardiner. Reforesting Pennsylvania's waste land; what and how to plant. 34 p. pl. Harrisburg, Pa., 1916. (Pennsylvania—Dept. of forestry. Bulletin No. 15.)

Foster, J. H., and Krausz, Harry B. Tree planting needed in Texas. 32 p. il. College Station, Tex., 1917. (Texas—Agricultural and mechanical college—Dept. of forestry. Bulletin 2.)

Scott, Chas. A., and Burr, Walter. Tree planting in Kansas. 29 p. il. Manhattan, Kan., 1916. (Kansas state agricultural college—Division of college extension. Extension bulletin No. 11.)

Forest Protection

Insects

Burke, H. E. Flat-headed borers affecting forest trees in the United States. 8 p. pl. Wash., D. C., 1917. (U. S. Dept. of agriculture. Bulletin 437.)

Hopkins, A. D., and Snyder, T. E. Powder-post damage by Lyctus beetles to seasoned hardwood. 20 p. il. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Farmers' bulletin 778.)

Webster, R. L. The white-marked tussock-moth. 4 p. il. Ames, Ia., 1916. (Iowa—Agricultural experiment station. Circular No. 33.)

Diseases

American forestry association. The pine blister disease which threatens the death of the white and five-leaved pines of the United States and Canada. 5 p. il. Wash., D. C., 1917.

Brisco, John M. Forest planting and the white pine blister rust. 4 p. Orono, Me., 1917. (University of Maine—Agricultural extension service. Extension bulletin No. 110.)

Hartley, Carl. The control of damping-off of coniferous seedlings. 32 p. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 453.)

Long, W. H. Preliminary report on the occurrence of western red-rot in Pinus ponderosa. 8 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 490.)

Pack, Charles Lathrop. An invasion from abroad, what shall we do about it? 3 p. Wash., D. C., American forestry association, 1917.

Paul, B. H. The pine blister. 18 p. il., map. Albany, N. Y., 1916. (N. Y.—Conservation commission. Bulletin 15.)

Shear, C. L., and others. Endothia parasitica and related species. 82 p. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 380.)

Webster, A. D. Tree wounds and diseases; their prevention and treatment; with a special chapter on fruit trees, 215. p. il., pl. London, Williams & Norgate, 1916.

Fire

Cœur d'Alene timber protective association. Eleventh annual report. 12 p. Cœur d'Alene, Idaho, 1916.

Washington forest fire association. Ninth annual report, 1916. 19 p. Seattle, Wash., 1916.

Forest Legislation

United States—Dept. of agriculture—Forest service. State forestry laws: Massachusetts. 21 p. Wash., D. C., 1917.

Forest Economics

Forest policy

Sherfesee, Wm. Forsythe. The industrial and social importance of forestry in China. 26 p. Peking, The Chinese social and political science review, 1916.

Forest Administration

United States—Dept. of agriculture—Forest service. January field program, 1917. 29 p. Wash., D. C., 1917.

United States—Dept. of agriculture—Forest service. National forest areas, June 30, 1916. 8 p. map. Wash., D. C., 1916.

United States—National forest reservation commission. Annual report for the fiscal year ended June 30, 1916. 10 p. Wash., D. C., 1916.

Forest Utilization

Lumber industry

Greeley, William B. Some public and economic aspects of the lumber industry; studies of the lumber industry, pt. 1. 100 p. maps, diagrs. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Report No. 114.)

United States—Interstate commerce commission. Docket No. 8131, in the matter of rates on and classification of lumber and lumber products, and related dockets, and study of present tariff provisions relating to the transportation of lumber and lumber products in the United States; supplemental and reply brief on behalf of West Coast lumbermen's association; Eastern Oregon lumber producers' association, Western pine manufacturers' association, California white and sugar pine association, California redwood association. 36 p. Portland, Ore., 1916.

Wood-using industries

McCreight, Arthur M. Poles purchased, 1915. 4 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 519.)

Oakleaf, Howard B. Douglas fir ship building. 9 p. il. Portland, Ore., Peninsula shipbuilding co., 1916.

Winslow, Carlile P., & Thelen, Rolf. The purchase of pulp-wood: some suggestions. 8 p. Madison, Wis., 1916.

Wood Technology

Mell, C. D. True mahogany. 24 p. il., pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 474.)

Schneider, E. E. Commercial woods of the Philippines: their preparation and uses. 274 p. pl. Manila, P. I., 1916. (P. I.—Bureau of forestry. Bulletin No. 14.)

Auxiliary Subjects

Natural resources

Hopkins, Albert A. Our country and its resources. 598 p. il. N. Y., Munn & Co., Inc., 1917. (Scientific American series.)

National and state parks

American scenic and historic preservation society. Twenty-first annual report, 1916. 956 p. pl. Albany, N. Y., 1916.

Palisades interstate park, N. Y. Sixteenth annual report, 1915. 31 p. pl., map. Albany, N. Y., J. B. Lyon co., 1916.

United States—Dept. of the interior. Progress in the development of the national parks, by Stephen T. Mather. 39 p. map. Wash., D. C., 1916.

Mathematics

Leaver, James M. The official estimator. 172 p. Oakland, Cal., Leaver manufacturing co., 1916.

Periodical Articles

Miscellaneous periodicals

American city, town and county edition, Jan. 1917.—Municipal use of the national forests for public recreation, by Henry Solon Graves, p. 1-4.

Breeders' gazette, Jan. 18, 1917.—The grazing homestead bill, by Will C. Barnes, p. 141-2.

Country gentleman, Jan. 13, 1917.—In a turpentine orchard, p. 41.

Country gentleman, Jan. 20, 1917.—Trees and lightning, by H. R. C., p. 31.

Country gentleman, Jan. 27, 1917.—Dwarf trees, by Albert A. Hansen, p. 7.

Country gentleman, Feb. 3, 1917.—Getting the most out of the woodlot, by Vico C. Isola, p. 4.

Countryside magazine, Dec., 1916.—Mahogany, by Harold Donaldson Eberlein and Abbot McClure, p. 277-8.

Fire protection, Jan., 1917.—European methods of forest fire protection and insurance, by John L. Cobbs, Jr., p. 7.

Ford times, Jan., 1917.—Fords and forests, p. 261-7.

Garden magazine, Feb., 1917.—Transplanting big trees, p. 44; Protecting trees against animals, by M. G. Kains, p. 52, 54.

Good roads, Feb. 3, 1917.—Wood block paving specifications of the American wood preservers' association, p. 84-5.

National geographic magazine, Jan., 1917.—Our big trees saved, p. 1-11.

National wool grower, Jan., 1917.—Grazing fees in national forests, by A. F. Potter, p. 21-3.

Nature study review, Feb., 1917.—A plan for the study of the elm tree in primary grades, by Susan B. Sipe, p. 55-8; Mountain laurel, by Leah Wheeler, p. 59-61.

Proceedings of the National academy of sciences, Nov., 1916.—The oaks of America, by William Trelease, p. 626-9.

Purdue agriculturist, Jan., 1917.—Why Indiana should have more trees, by E. A. Gladden, p. 20-1, 56.

Revue horticole, Dec. 16, 1916.—Les pins du Mexique, by S. Mottet, p. 191-4.

Scientific American supplement, Dec. 9, 1916.—The raw materials used by the rubber manufacturers, by B. D. Porritt, p. 374-5.

Scientific American supplement, Jan. 6, 1917.—The pottery tree, p. 7.

Successful farming, Feb., 1917.—Evergreen windbreaks, by F. E., p. 48-9.

Trade journals and consular reports

American lumberman, Jan. 13, 1917.—The case for and against the wooden shingle, p. 33; How insect pests affect national forests, by Henry Solon Graves, p. 35; Exhibit of wood for sporting goods completed, p. 36; Economy and safety in farm house construction, by R. S. Kellogg, p. 38D.

American lumberman, Jan. 20, 1917.—1916 remarkable year in building construction, p. 31; Confer on blister rust, p. 46; Shipbuilding in Canada has revived, p. 51.

American lumberman, Jan. 27, 1917.—Lumber industry conditions revealed by the Forest service, by W. B. Greeley, p. 34-5, 79; A uniform cost system for hardwood lumber, by T. L. Hoskins, p. 38-9; The necessity for co-operation in the lumber export trade, by J. J. Donovan, p. 39-40. Tells of Russia's timber resources, by Felix Willoughby Smith, p. 81.

American lumberman, Feb. 10, 1917.—Large amount of lumber used in musical instruments, p. 57; Black walnut comes into greater use, p. 61.

Barrel & box, Jan., 1917.—Transportation of cooperage stock, by Fred Esch, p. 20; Box material, by Fred Esch, p. 20; Lumber feetage scale, by N. G. Near, p. 35; Crating and loading of veneers, by H. F. Arnemann, p. 39.

Canada lumberman, Jan. 15, 1917.—Douglas fir export trade problem, by H. R. MacMillan, p. 28-9.

Canada lumberman, Feb. 1, 1917.—Blister rust threatening white pine, p. 25; Forest telephone erection costs, p. 28.

Furniture manufacturer and artisan, Dec., 1916.—The artificial bending of wood, by J. St. C. McQuilkin, p. 242-3; Spun paper and some of its uses, by Rolf Thelen, p. 244-5.

Hardwood record, Jan. 25, 1917.—The strength of wood, by Hu Maxwell, p. 18-21.

Hardwood record, Feb. 10, 1917.—The elasticity of wood, by Hu Maxwell, p. 15-17; Canoes made from single molded panel, p. 37; A mill scale study of maple, by David G. White, p. 41a-f.

Lumber trade journal, Jan. 15, 1917.—Timber conservation versus taxation, p. 11.

Lumber world review, Jan. 25, 1917.—Lumber favored for farm structures, by R. S. Kellogg, p. 23-6.

Package, Jan., 1917—Result of box test, p. 23-4; Standardize poultry package, p. 46.

Pulp and paper magazine, Dec. 15, 1916.—The Christmas tree trade, p. 429-30; Pulpwood measurements and some factors involved in chipping and baling pulpwood, by O. F. Bryant, p. 431-6.

Pulp and paper magazine, Jan. 4, 1917.—The pulp and paper industry in Canada, by O. F. Bryant, p. 11-28; A fire protection system for the upper Ottawa region, p. 31-2.

Pulp and paper magazine, Jan. 11, 1917.—The press machine for wood pulp, by Knud Dahl, Jr., p. 43-4; Canada's white

pine possessions threatened with extermination, by H. T. Gussow, p. 45–6.

Railway review, Jan. 13, 1917.—Timber treating plant of the Boston elevated railway, by E. W. Bright, p. 67–8.

St. Louis lumberman, Feb. 1, 1917.—Further facts about white pine blister rust, by George Latta Barrus, p. 51; Co-operation in the lumber industry, by R. S. Kellogg, p. 56–7; Some notions of an outsider on lumber distribution, by W. B. Greeley, p. 59–61; The Greeley report, by E. T. Allen, p. 86.

Southern lumber journal, Feb. 1, 1917.—The value of North Carolina and forest resources of other southern states, by Job Taylor, p. 38–9.

Timber trade journal, Dec. 30, 1917.—A useful tree; the silver fir in Ireland, p. 1031; The utilization of sawdust, p. xxiii–xxiv.

Timber trade journal, Jan. 27, 1917.—Creosoted timber fire resisting, by J. E. Barton, p. 142; Scientific lumber drying, by Z. Clark Thwing, p. xxi, xxiii.

Timberman, Jan., 1917.—Taxation of timber, p. 28–9; Wooden shipbuilding, by Fred A. Ballin, p. 41–3; Organization of Chinese forest service, by Forsythe Sherfesee, p. 45–6; Lumber and shingle making in Chile, by Albert Banderet, p. 46–7; Possibilities of Siberian lumber development, by Waldemar Toritch, p. 47; American opportunities in Russia, by Nicholas P. Melnikoff, p. 48.

United States daily consular report, Jan. 17, 1917.—Spain provides for national parks, by Carl Bailey Hurst, p. 211; Forestry development in Finland, p. 212.

United States daily consular report, Jan. 23, 1917.—British supplies of paper-making materials, by Ripley Wilson, p. 290; British utilization of kapok, by Hamilton C. Claiborne, p. 295.

United States daily consular report, Jan. 27, 1917.—Wooden shipbuilding in the United States, p. 355–7.

United States daily consular report, Jan. 30, 1917.—Forest resources of Bulgaria, by Dominic I. Murphy, p. 396–8.

United States daily consular report, Jan. 31, 1917.—Growth of Canadian pulp and paper industry, p. 407.

United States daily consular report, Feb. 2, 1917.—Supply of mahogany in the Gold Coast colony, by W. J. Yerby, p. 444–5.

United States daily consular report, Feb. 3, 1917.—Chinese wood oil industry, by R. C. Mackay, p. 457–61.

United States daily consular report, Feb. 7, 1917.—Paper-pulp possibilities in Brazil, by Alfred L. M. Gottschalk, p. 508–10.

United States daily consular report, Feb. 13, 1917.—Argentine market for lumber, p. 600–1.

Veneers, Feb., 1917.—Difficulties in shipping mahogany logs, p. 14; Wooden musical instruments, p. 14.

Wood-worker, Jan., 1917.—Log sawing with the English frame, by W. J. Blackmur, p. 36–7; Something about coffins, by John Carter, p. 37–8.

Forest Journals

Canadian forest journal, Jan., 1917.—Better apparatus for forest fire fighting, by H. C. Johnson, p. 896–9; Forests in Italian and Balkan war zones, by J. S. Illick, p. 919–22.

Conservation, Feb., 1917.—White pine threatened, p. 5; Lookout towers, by Clyde Leavitt, p. 8.

Conservationist, Jan., 1917.—Public policy in relation to forest lands, by George D. Pratt, p. 3–7.

Forest leaves, Feb., 1917.—Annual meeting of the Pennsylvania forestry association, p. 2–6, 9–11; Recent news about forests of the war zones, by C. A. Schenck, p. 11–13; The United Sports-

men and what they are doing for forests and wild life, by Frank Gray, p. 15–16.

Forestry quarterly, Dec., 1916.—Some suggestions on the control of mistletoe in the national forests of the northwest, by James R. Weir, p. 567–77; Some characteristics of slash pine, by Wilbur R. Mattoon, p. 578–88; National forest organization, by S. W. Wynne, p. 589–94; Fire-season forecasts on a California forest, by R. W. Ayres, p. 595–8; Conversion methods; a visit to the forests of Chaux and Faye de la Montrond, France, by H. R. MacMillan, p. 599–604; Passing views of forestry in British South Africa, by H. R. MacMillan, p. 605–23; Forestry in India from a Canadian point of view, by H. R. MacMillan, p. 624–49; China's forest laws, by F. Sherfesee, p. 650–61; The significance of certain variations in the anatomical structure of wood, by R. P. Prichard and I. W. Bailey, p. 662–70; Douglas fir fiber, with special reference to length, by H. N. Lee and E. M. Smith, p. 671–95; The economic woods of Hawaii, by Vaughan MacCaughey, p. 696–716.

Indian forester, Nov.-Dec., 1916.—Teak taungya plantations in the Henzada-Maubin division, by C. W. Allan, p. 533–7; The road drag, by A. J. S. Butterwick, p. 537–45; The forest resources of Newfoundland, p. 567–70.

Quarterly journal of forestry, Jan., 1917.—Relationship of the Douglas fir to lime in soil, by William Somerville, p. 1–6; The improvement and maintenance of soil fertility in woodlands; by W. L. Taylor, p. 6–16; Discussion on the present position and future development of forestry in England and Wales, p. 20–58; Large Sitka spruces in Scotland, by A. Henry, p. 65–6; Income tax on woodlands, by H. J. Elwes and Wm. A. Haviland, p. 66–8; The pine beetle in larch shoots, by Wm. Somerville, p. 68–72; A scheme to encourage afforestation, by James Smith, p. 74–6; Memorandum on the Danish moorland society, p. 77–9.

Revue des eaux et forêts, Nov. 1, 1916.—Influence de l'intensité des éclaircies sur le rendement des peuplements réguliers de sapins, by Emile Mer, p. 305–9; Forêts russes d'extrême-orient, Province maritime, by A. Arnould, p. 310–16; Le service forestier aux armées, p. 322–8.

Revue des eaux et forêts, Dec. 1, 1916.—Étendue des forêts domaniales en France, by G. Huffel, p. 337–48; La réparation des dommages de guerre aux forêts, by J. Demorlaine, p. 349–53; L'exploitation des bois au Tonkin, by J. Prades, p. 354–6; Le bois digestible, p. 360–2.

Tiddskrift for skogbruk, Dec., 1916.—Gammelskog og nutidsskog (Former forests and present forests), p. 417–24; Australiens skoger (Australia's forests), by D. E. Hutchins, p. 424–8; Hr. forstmester Vestby og mine beregninger (Hr. Vestby and my calculations concerning a timber shortage), by Agnar Barth, p. 428; Skog og planting paa Dovre (Forests and plantations in Dovre), by Haakon Lie, p. 433–8.

Tidsskrift for skogbruk, Jan., 1917.—Om snauhugst og blaedning (Concerning clear cutting and selection cutting), by K, p. 2–8; Efter en liten Vestlandsvisit (After a little visit to the west coast), by A. K. Myhrwold, p. 8–14; Landbrukshiskolen og dens skogbruksavdeling (The agricultural college and its department of forestry), by J. G. Böhmer, p. 14–20.

Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay $367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal coöperation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by coöperation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.